

the Ka-Ka Parrot cannot in this point be said to approach the *Trichoglossi* (badly so called).

The peculiarity of the tongue of *Nestor* consists in the fact that the anterior edge of the unguis, always free (though for a very short distance) and jagged, as mentioned above, in the other birds of the class, is here prolonged forwards, beyond the tip of the tongue, for about $\frac{1}{10}$ inch as a delicate fringe of hairs, with a crescentic contour. This fringe seems to result from the breaking up into fibres of the forward-growing plate, which is always marked by longitudinal striations, clearest anteriorly, the result of unequal density and translucency of the tissue composing it, though on making a cross section I was not able to find any of the longitudinal papillary ridges which are present in the human nail and which the striation led me to expect. The unguis is also longer than broad, and very narrow considering the size of the bird, as is also the whole tongue, though the length is greater than in others of the class. In the living bird the mouth is moist, as in the Lories, and not, as in the Cockatoos and others, dry and scaly.

From these considerations, and a comparison of the accompanying drawings of the tongues of *Stringops*, *Nestor*, and *Trichoglossus*, it is evident that the structure of this organ would lead to the placing of *Nestor* among the typical Parrots, though an aberrant one, and not with the *Trichoglossinæ*; and other points in its anatomy favour this conclusion.

November 5, 1872.

The Viscount Walden, F.R.S., President, in the Chair.

The Secretary read the following reports on the additions to the Society's Menagerie during the months of June, July, August, and September, 1872 :—

The total number of registered additions to the Society's Menagerie during the month of June 1872 was 211; of which 72 were by birth, 25 by presentation, 92 by purchase, and 22 were received on deposit. The total number of departures during the same period, by death and removals, was 94.

The most remarkable additions in June were :—

1. A fine pair of Vulturine Guinea-fowls (*Numida vulturina*), presented, June 14th, by Dr. John Kirk, C.M.Z.S., H.B.M. Consul at Zanzibar. Writing from Zanzibar (August 3rd) Dr. Kirk informs me that this Guinea-fowl has a more northern range than he had previously supposed, being essentially a Somali-land species. Dr. Kirk doubts whether it is ever found south of the river Juba, the information that it was to be met with at Lamoo (P. Z. S. 1867, p. 953) not resting on sufficient authority.

2. A specimen of a new species of small Parrakeet of the genus *Loriculus*, from Cebu, Philippine Islands, purchased June 18th, of Dr. A. B. Meyer.

In April 1871 we obtained from a dealer in Liverpool a pair of

the same species of Parrakeet. These I determined as *Loriculus culacissi**; and when Dr. Meyer showed me his bird I told him that I believed it to be of that species. Dr. Meyer, however, was of a different opinion, and in order to settle the question was kind enough to allow me to examine the specimens of *Loriculus* in his collection made in the Philippines. On comparing Dr. Meyer's skins with the descriptions given in Dr. Finsch's monograph, I found that Dr. Meyer was undoubtedly correct. Three species of *Loriculus* were represented in his collection, namely *L. culacissi* from Luzon, *L. regulus* from Negros and Panay, and the present bird, which appeared to be undescribed, from Cebu. Under these circumstances I sent a short notice of the last-mentioned species to 'The Ibis' for July last, and proposed to call it *L. chrysonotus*, from its golden back †.

The total number of registered additions to the Society's Menagerie during the month of July 1872 was 122; of which 31 were by birth, 57 by presentation, 17 by purchase, 5 by exchange, and 12 were received on deposit. The total number of departures during the same period, by death and removals, was 94.

Almost the only arrival of special interest was twelve Natterer's Bats (*Vespertilio nattereri*, Kuhl), presented, July 19th, by Lord Lilford, F.Z.S. We vainly endeavoured to keep these animals alive in captivity: they all died within a few days.

The total number of registered additions to the Society's Menagerie during the month of August 1872 was 115; of these, 20 were by birth, 45 by presentation, 29 by purchase, 4 by exchange, and 17 were received on deposit. The total number of departures during the same period, by death and removal, was 141.

The most noticeable of the additions were:—

1. A female two-horned Rhinoceros, stated to have been captured in Malacca, purchased of Mr. W. Jamrach, August 2nd, for the sum of £600. As soon as this animal arrived in the Gardens it became obvious that it was of a different species from the female two-horned Rhinoceros previously purchased of Mr. Jamrach‡, and that consequently there must be two species of this form of Rhinoceros in existence.

On reference to authorities it appeared evident to me that the animal last received was the true *R. sumatrensis*§ of previous writers.

This might have been expected from the locality in which it was obtained, the fauna of Malacca being notoriously similar to that of Sumatra.

Under these circumstances it became, in my opinion, necessary to give a new name to the animal previously received from Chittagong; and in a communication made to Section D of the British Association at Brighton on the 16th of August last, I accordingly proposed to call it *Rhinoceros lasiotis*||, from the peculiar long hairs which

* See P. Z. S. 1871, p. 479, and Rev. List of Vert. p. 202.

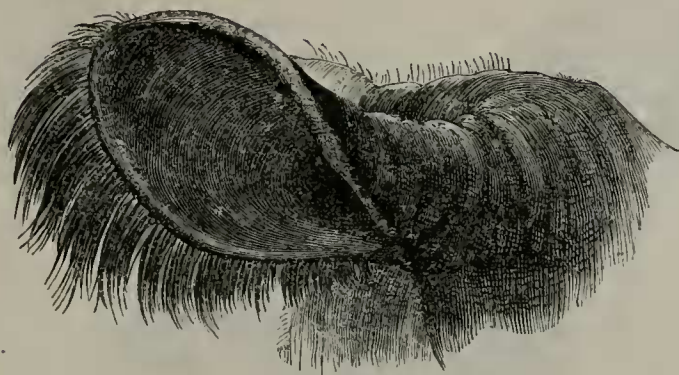
† See Ibis, 1872, p. 323, pl. xi.

‡ See *antea*, p. 493, pl. xxiii.

§ *Rhinoceros sumatrensis* of Cuvier, Règne An. i. p. 240 (1817), founded on Bell's description of an animal killed in Sumatra, published in Phil. Trans. 1793. Raffles in 1820 named the same animal *R. sumatranus* (Linn. Trans. xiii. p. 268).

|| See 'Times' of August 19, p. 5; and 'Athenæum,' August 24, p. 243; also 'Nature,' October 24, p. 518.

Fig. 1.

Right ear of *Rhinoceros lasiotis*.

border the outer edge of the ear-conch (see fig. 1), and which are of themselves sufficient to render the animal easily recognizable from *R. sumatrensis*. Dr. J. Anderson, in his excellent description of our Chittagong animal under the name of *R. sumatrensis* (*anteà*, p. 130), has specially commented on this peculiarity, but, not being aware that he was dealing with a different species, was inclined to think it might be individual. In *R. sumatrensis* (*verus*) (fig. 5, p. 793) the ears are filled with short bristly hairs internally, but there is no special elongated fringe on the outer edge. In *R. lasiotis* (fig. 3, p. 792) the interior of the ear-conch is nearly naked.

Our Sumatran Rhinoceros, although an adult or rather aged animal, was much smaller in bulk than the hairy-eared, and at least 6 inches less in height at the shoulder*.

Another point of distinction between the two animals is the longer tail of *R. sumatrensis*, which is only covered by short black straggling bristles. In *R. lasiotis* the tail is shorter and tufted, terminating in long brown hairs.

The distance between the ears is much greater in *R. lasiotis* than in *R. sumatrensis*, as will be seen by the accompanying drawings (figs. 2 and 4, pp. 792, 793); and there can be no doubt that the skulls of the two species, when they can be compared, will exhibit corresponding differences.

The skin of *R. lasiotis* is smoother and paler in colour; the hairs are longer and finer and of a rufescent hue, giving the animal a general colouring of lightish brown. In *R. sumatrensis* the skin is much darker and the hairs are short and bristly.

* Mr. Bartlett's measurements of our five Rhinoceroses (August 24, 1872) are as follow:—

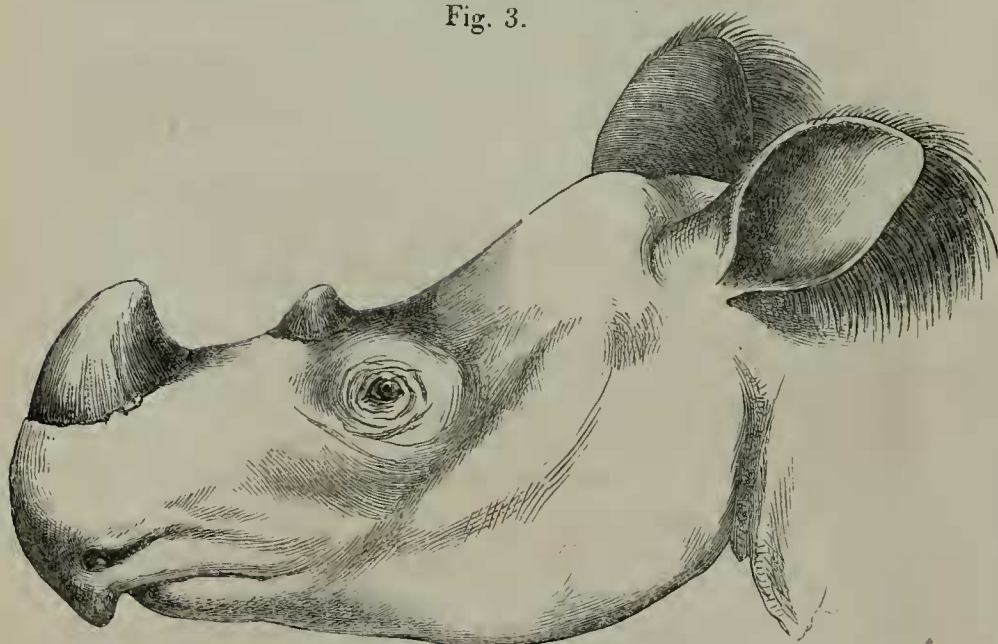
	ft.	in.	
1. <i>R. unicornis</i> ♂	5	4	} height at shoulder.
2. " " ♀	5	2	
3. <i>R. sumatrensis</i> ♀	3	8	
4. <i>R. lasiotis</i> ♀	4	4	
5. <i>R. bicornis</i> ♂	4	6	

Fig. 2.



Front view of head of *R. lasiotis*.

Fig. 3.



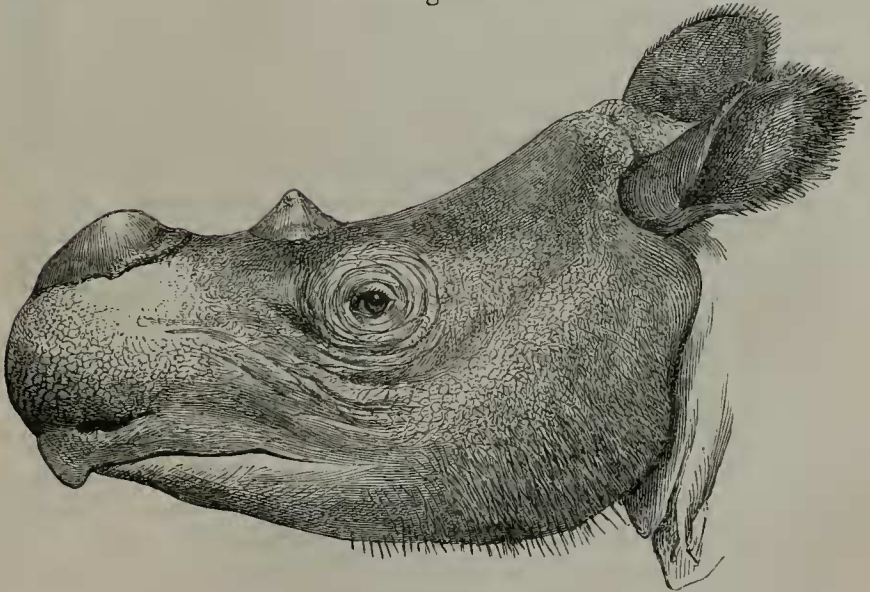
Side view of head of *R. lasiotis*.

Fig. 4.



Front view of head of *R. sumatrensis*.

Fig. 5.



Side view of head of *R. sumatrensis*.

These differences are well shown in the water-colour drawings of these animals by Mr. Wolf, which I exhibit, and of which I hope hereafter to publish copies in the Society's 'Transactions,' together with some notes on the species of *Rhinoceros* living in the Society's Gardens.

Mr. Smit's figure of the Sumatran *Rhinoceros* (Plate LXVII.) may also be compared with that of *R. lasiotis* (Plate XXIII., p. 494) already given in the 'Proceedings.'

Lastly I have to add with regret that our Sumatran *Rhinoceros* did not live long in the Society's Gardens, but died very suddenly on the night of the 21st of September.

Our Prosecutor has made notes on the anatomy and osteology of this animal, which he will shortly bring before the Society. In the mean time I have compared the skull (which I now exhibit) with the skull of the Sumatran *Rhinoceros* in the Museum of the College of Surgeons, received from Sir Stamford Raffles, with which it agrees quite sufficiently, although the nasal portion is decidedly broader in the present specimen. Mr. Garrod, however, informs me that the present skull agrees perfectly with the adult skull of *Rhinoceros sumatrensis* from Pegu in the British Museum.

The present skull is evidently that of a very old animal, the lower incisors having entirely disappeared. Professor Flower has informed me that the same is the case with a skull of *R. sumatrensis* in the Brussels Museum.

The skin and skeleton of this animal have been purchased of the Society by the Trustees of the British Museum.

I may remark that the stuffed specimen of the Sumatran *Rhinoceros* in the Gallery of the British Museum (which originally came from the Leyden Museum) is evidently a young male of the same species. I observe that it has recently had its name changed to *Ceratorhinus crossii*; so that it is probable that our specimen will have this name applied to it when placed in the British Museum. But even should it be proved that the *Rhinoceros lasiotis* is the true *sumatrensis* (as Dr. Gray has maintained*), it would not, I think, under any circumstances, be right to apply the term *crossii* (founded on what is probably only an abnormal horn) to this species.

2. A female of what appears to be a small form of the Mantchurian Deer (*Cervus mantchuricus*), inhabiting Japan, received in exchange from the Jardin d'Acclimatation of Paris. On the 18th of March last we received a male of this same animal as a present from Mr. T. R. Wheelock of Shanghai. Having been informed by the donor that this Deer was from Japan, I at first referred it to *Cervus sika*, the only described species of *Cervus* of that country. But this was decidedly an error; that is, the species is decidedly different from that which we call *Cervus sika*†, and does not much differ from our *Cervus mantchuricus*, except in size, standing only 2 ft. 8 in. in height at the shoulders, instead of 3 ft. 8 in., and thus being intermediate between *C. mantchuricus* and *C. pseudaxis* sive *taëvanus*.

A second female apparently of the same form, but differing slightly

* Ann. Nat. Hist. ser. 4, vol. x. p. 207, "On the double-horned Asiatic *Rhinoceros*." See also my remarks, *ibid.* p. 298

† Cf. Trans. Zool. Soc. vii. p. 346.



J. Smith del.

RHINOCEROS SUMATRENSIS ♀

by the Hon. Mr. and Mrs.

in size and markings, has been kindly lent to us by the Royal Zoological Society of Amsterdam ; so that we have now a buck and two does of this form of Deer in the Society's Gardens.

3. Two male and one female Gambel's Colins (*Callipepla gambelli*), received in exchange August 29th. This beautiful species has never reached us alive before ; and the female was not known to Mr. Gould (see his 'Monograph of the Odontophorinæ,' pl. xvii.)*.

4. A Kea or Mountain-Parrot (*Nestor notabilis*), presented by the Acclimatization Society of Canterbury, N.Z., August 31st. This rare Parrot unfortunately only survived its arrival in this country a few days.

The total number of registered additions to the Society's Menagerie during the month of September 1872 was 94 ; of these, 1 was by birth, 50 by presentation, 40 by purchase, and 3 were received on deposit. The total number of departures during the same period, by death and removal, was 76.

The most noticeable of the additions were :—

1. A collection of Parrakeets from New Zealand, purchased Sept. 23rd. Besides *Cyanorhamphus novæ-zelandiæ* and *C. auriceps* (both of which we had previously received), this series embraced two examples of *Cyanorhamphus alpinus* †, which its describer now again holds to be a good species, and which is new to the collection.

2. A Snake of the genus *Coronella*, from Robben Island, near Cape Town, S. Africa, presented, September 24th, by Mr. G. H. B. Fisk. Dr. Günther considers that this belongs to a new species, and will describe it as *Coronella phocarum* ‡.

The Secretary also reported the birth of a third Hippopotamus (*Hippopotamus amphibius*), which had taken place that day in the Society's Gardens at 7 A.M.

The period of gestation in the present instance had been eight calendar months less four days, according to the keeper's observations.

The two former births had taken place on the 21st of February 1871 and the 7th of January 1872 ; but neither of these animals had lived many days.

In the present instance, the little animal having already begun to suck, and being more lively in its movements, a more favourable result was hoped for.

The following letter, dated Australian Museum, Sydney, June 14th, 1872, addressed to the Secretary, was read :—

"DEAR DR. SCLATER,—I have had a series of photographs made of the different Wombats ; and as it appears there is still some doubt about certain species, I now enclose copies of them.

"1. The *Phascolomys latifrons*, of a yellow colour, comes from the north-west bend of the Murray River. This species was first de-

* Both sexes are well figured in the 'Field' for Nov. 28, 1872, p. 300.

† *Platycercus alpinus*, Buller, Ibis, 1869, p. 39.

‡ See below, P. Z. S. for Nov. 19.

scribed from a skull by Professor Owen; and Gould's names are correct. The skull is very much rounder, contracted (but still broad) between the orbits, and the frontal bones are wedged in between the nasal; this is very characteristic of this species. The postorbital process is also much raised, and is never flat as in the allied species, the *P. lasiorhinus*.

2. "The *Phascolomys lasiorhinus*. Fur dark mouse-colour and silky; nose hairy; skull rather flat above, as regards the nasal bones, no wedge piece enters between them from the frontals; the mandibular condyle ends in a thin process at the base of the coronoid.

"3. *Phascolomys lasiorhinus*, var. *niger*. In this variety the skull is very much contracted between the orbits, and appears to be slightly more elongate. Our specimens come from Port Lincoln. I regret not to have a photograph of the skeleton of this species at hand; the scapula is broader than in *P. latifrons*, which has the narrowest scapula of all the Wombats known to me.

"4. *Phascolomys platyrhinus*. Grizzly grey-brown in colour; hair very harsh to the touch. This well-known species inhabits the south-east coast of New South Wales, and is probably also found in Victoria. I enclose photographs of it.

"5. *Phascolomys assimilis*, Krefft. Resembling in shape and colour the common Wombat, *P. platyrhinus*, but different in the skeleton. The skull is shorter and broader, the teeth are larger, the upper grinders more pushed out sideways, the lower ones more curved and turned inwards. There is a considerable difference in the incisor teeth: the upper ones are flat, compressed, striated, and with a groove in the middle; the lower ones are much curved.

"6. *Phascolomys wombat* from Tasmania, allied to *P. assimilis* and to certain fossil species.

"Yours sincerely,

"Dr. P. L. Sclater, F.R.S."

"GERARD KREFFT."

An extract was read from a letter addressed to the Secretary by Mr. Walter J. Scott, C.M.Z.S., dated Valley of Lagoons, Queensland, June 5th, 1872, concerning the question of the supposed native Tiger of Queensland, already referred to in former letters*.

Mr. Scott stated that Mr. Robert Johnstone, an officer of the Native Police, being in the scrub on the coast-range west of Cardwell with some of his troopers, had seen a large animal in a tree about forty feet from the ground, which on being approached sprang off to another tree about ten feet off, grasped it and descended tail first. The animal was said to have been larger than a pointer-dog, of a fawn-colour, with markings of deeper shade. Its head was quite round, and showed no visible ears; its tail was long and thick.

Mr. Scott was now more than ever convinced of the existence of the animal, and would not be content until he got specimens.

* See P. Z. S. 1872, p. 355.

Mr. Sclater read the following extract from a letter addressed to him by Professor J. Reinhardt, of Copenhagen, dated August 30th, 1872:—

“In turning over the ‘Proceedings,’ I have seen and read your valuable paper on the *Quadrumana* found north of Panama—and take the present opportunity to offer a suggestion with reference to the *Ateles vellerosus*, and particularly to the precise locality of this species.

“We have in our collection a full-grown female of a large *Ateles* brought from Mexico, and presented to the Museum in 1843 by the late botanist Prof. S. Liebmann. I have hitherto considered it a new species and given it a provisional name; but when I saw your beautiful figure of *Ateles vellerosus*, it immediately struck me that our Mexican Monkey might be that species. It is true our specimen is a much larger animal (total length 53"); the yellowish colour on the inside of the limbs does not extend so far down to the hands as in your specimens; and the whiskers offer only a faint trace of the whitish colour which encircles the face of your *Ateles*. But the difference in size seems not to be of much consequence, as long as it is uncertain whether your specimens are fully grown or not; and the difference in colour is, upon the whole, not more perplexing than that occurring in several other species of *Ateles*. I myself have little doubt of the identity; but, for the purpose of enabling you to judge for yourself, I enclose a drawing of my *Ateles*, made many years ago, shortly after it had been stuffed.

“In the notes communicated to me by my late friend Prof. Liebmann, it is stated that the said Monkey was shot in the neighbourhood of the small place Mirador, situated not far from the volcano of Orizaba in the State of Vera Cruz. This *Ateles* is common there, and lives in small troops in the deep barrancas up to an elevation of 2000 feet above the sea. Furthermore he met with it in the eastern parts of the State of Oaxaca; it was to be found in the forests there even up to 4000 feet, the same elevation to which the Tapir ascends. But at the same time he expressly states that he never met with this *Ateles*, nor indeed with any other Monkey, on the Pacific slope of the great Cordillera in Oaxaca, and that, as far as he could learn, Monkeys are to be found on the western coast only *south* of Tehuantepec. I therefore strongly suspect that Mr. Boucard had been misguided by untrustworthy information, when he told you (*anteà*, p. 5) that his specimen was procured near Acapulco. It may have been sent to him from that harbour; but it has certainly been killed at some distant place on the eastern slope of the Cordillera.

“Still one more remark, and I have done. If I am right in referring my *Ateles* to the *A. vellerosus*, and not to *A. melanochir*, the only evidence of the occurrence of this last-mentioned species in Mexico rests, so far as I can see, on the specimen sent by Depe to the Museum at Berlin. But, from your note upon the northern limits of the *Quadrumana* in the New World (*Nat. Hist. Rev.* 1861, p. 507), it seems that this specimen, in some respects, does not quite agree

with the typical *A. melanochir* from Central America. I therefore should think it desirable to have it carefully compared with the *A. vellerosus* hitherto rather insufficiently known. Deppe procured his *Ateles* near the place from where Liebmann brought his Monkey; and from what I myself have been able to learn by personal experience in other part of tropical America, I am disposed to doubt the occurrence of two nearly allied but still distinct species of these large Monkeys in the very same locality. Should indeed, as I suspect, the *Ateles* sent home by Deppe really turn out to be an *A. vellerosus*, then the species would be the only Monkey known to range so far to the north as to the southern provinces of Mexico.

"P. L. Sclater, Esq."

"Yours very truly,
"J. REINHARDT."

In reference to the point last commented upon in Prof. Reinhardt's letter, Mr. Sclater stated that Prof. Peters had, at his request, kindly re-examined the specimen of *Ateles* in the Berlin Museum obtained by Deppe at Alvarado, and was now of opinion that it belonged to the species figured (P. Z. S. 1872, p. 2, Plate II.) as *Ateles vellerosus*, although it did not quite agree with Dr. Gray's description of that species in his Catalogue of Monkeys.

It would appear, therefore, that this species is the only certainly known *Ateles* which occurs in Mexico.

An extract was read from a letter addressed to the Secretary by Mr. R. Swinhoe, dated August 21st, in which he gave the following account of Deer belonging to a gentleman in Shanghai, which he believed to be *Cervus schomburgki*.

"I visited another gentleman who had a buck *Cervus sika*, and a buck brought by a ship from Singapore, which bothered me at first. It was in its reddish summer coat, and was spotted on the posterior half of its body. I learned that it had been presented to a European by the King of Siam. Its horns were just budding; but its master had the pair which were shed last year.

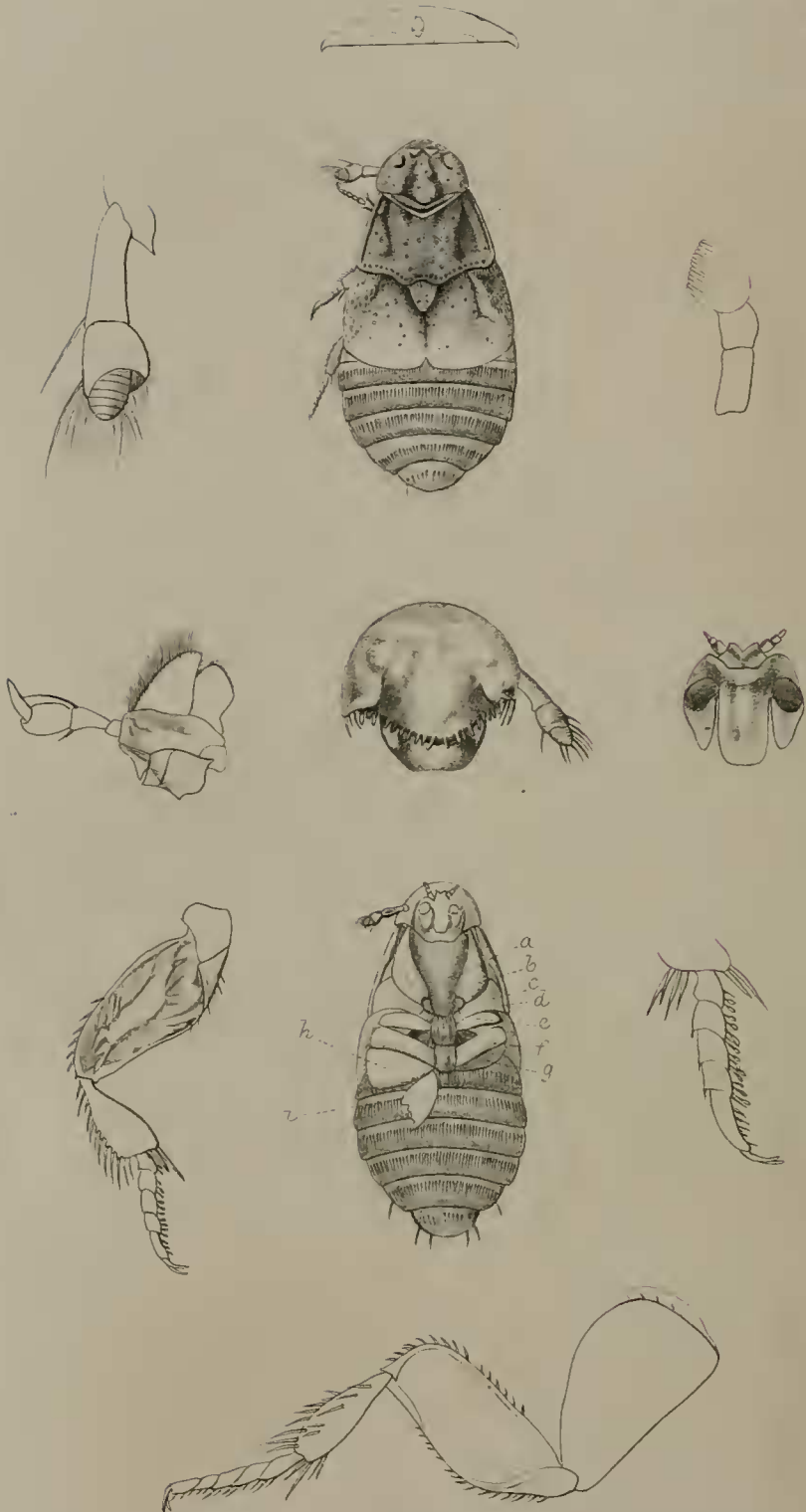
"The general appearance of the live animal gave one the idea of a *Panolia*; and I thought we had here the *P. platyceros* of J. E. Gray; but a view of the cast horns proved, from the straightness of the frontal snag, that the animal was rather *Rucervus* or Barasingha, and without doubt the *R. schomburgki*.

"A copy of your illustrated paper on Deer (for which I have to thank you much), lately come to hand, enables me to describe the animal more fully.

"*Cervus (Rucervus) schomburgki*, Blyth. Male in summer coat.

"In length of head, style of tail, and general form, like your *C. eldi* (in summer). Ears longer. Legs much longer and more slender. Upper parts of the same reddish-yellow colour (as in picture), but covered with numerous yellowish-white spots on the posterior half of the body, with a long yellowish-white horizontal line running along the lower part of the side above, and parallel to the border that





G. H. Ford.

Mintern Bros imp

Platypsilla castoris

separates the darker colour of the upper parts from the paler belly. Tail similar. Its lower parts, however, are not pure white, but dingy yellowish, varied with white on the throat and on the breast.

"We have, then, in this animal a *Panolia* with the horns of a *Rucervus*; and I suspect you are right in suggesting (p. 349) that 'all three will be ultimately found to belong to the same subgeneric group.'

"I am trying to persuade my friend to send this rare and noble beast to the Society's Gardens."

The following papers were read :—

1. On *Platypsyllidæ*, a new Family of Coleoptera.

By J. L. LE CONTE, M.D.

[Received June 24, 1872]

(Plate LXVIII.)

Mentum large, transverse, flat, corneous, emarginate in front, with the angles broadly rounded; sides rounded, trilobed behind; middle lobe parallel on the sides, broadly rounded at tip: the lateral lobes are very large, flat, subtriangular processes, obliquely rounded on the outer margin, straight on the inner side, gradually narrowed behind, and rounded at the tips; these processes are nearly as long as the middle lobe, separated from it by narrow fissures, and, like it, project far over the gula. Ligula broad, corneous, filling up the emargination of the mentum, and projecting beyond it, emarginate in front, without paraglossæ. Labial palpi short, three-jointed: first joint thick, broader than long; second joint much thinner, about as long as wide; third narrower, and longer than the second. Lingua fleshy, concealed behind the ligula, emarginate in front.

Maxillæ large and strongly made; stipes broad, outer portion corneous; cardo large and corneous; lobes two, large, flat, and thin, ciliated with long bristles, outer one somewhat triangular, with curved sides; inner lobe smaller than the outer, broadly rounded at tip. Maxillary palpi four-jointed: first joint short; second triangular, a little longer than wide, outer angle with a strong bristle half as long as the third joint, inner angle with a much longer bristle extending nearly to the tip of the fourth joint; third joint triangular, larger than the second; fourth subfusiform, narrower, but scarcely shorter than the third.

Antennæ with the first joint elongate, subcylindrical, with a very long bristle at the outer distal angle, and a short one at the inner angle; second joint large, about half as long as the first, cup-shaped, fringed with long hairs; remaining joints forming an oval club, with distinct transverse articulations fringed with long hairs. (I cannot count accurately the number of joints in the club, but think I can detect only seven, which would make the total number of joints in the antenna nine. The base of the club is received so deeply in the cup-shaped second joint, that one joint may have escaped my notice.

Want of material for further dissection prevents more accurate investigation in regard to this subject, which, however, is of but small importance.) The antennæ are inserted under the edge of the side margin of the head, not far from the hind angles, and are not much longer than the head; when retracted they are received in deep marginal grooves on the *dorsal* surface of the prothorax.

Mandibles small, flat, subquadrate, with the outer side very much rounded, the inner side deeply crenulate, or rather pectinate, resembling those of *Corylophus*, as figured by Wollaston ('*Ins. Madeirensia*'); stipes well developed, corneous, distinctly biarticulated.

Head nearly semicircular, with acute edge; cranium very slightly convex, without distinct frontal suture; occiput slightly prominent, fringed with stout depressed spines, forming a kind of comb, exterior to which, on each side, are long hairs fringing the hind angles; between the occiput and the front margin of the prothorax is a deep oblique sulcus, forming an obtuse angle at the middle. Labrum in the form of a broad segment of a circle, about four times as wide as long; when viewed from beneath, the hind margin is seen to be membranous on each side; there is a deep fovea at the middle; and the hind angles are somewhat prolonged. Eyes completely wanting. On the upper surface of the cranium, in front of the antennæ, there is seen on each side a large oval surface, the nature of which is unknown to me.

Prothorax trapezoidal, upper surface very slightly convex; apex acutely emarginate, side margin deeply grooved from the front angles nearly to the base, where the groove bends inwards, and becomes a sinuous line of large punctures parallel with the basal margin; the anterior part of this groove is used for the reception of the antennæ; the base of the prothorax is obliquely sinuate on each side, broadly and deeply emarginate in front of the scutellum; the hind angles are rounded, and fringed with long hairs. Prosternum very large, flat, subtriangular, concealing the insertion of the coxæ, produced behind into a large, broad process, rounded at tip, and fringed with long hairs; this process extends over the front part of the mesosternum; side pieces separated apparently from the pronotum by suture; coxal cavities open behind.

Mesothorax short; scutellum large and triangular; mesosternum obtusely elevated in front, where it is covered by the prosternum, produced behind into a similar broad obtusely rounded process, fringed with long hairs, and projecting in like manner over the front part of the metasternum; side pieces large, transverse, finely aciculate, not distinctly divided.

Metathorax short; metasternum covered in front by the process of the mesosternum, produced behind into a similar process, fringed with long hair, and projecting over the femoral articulation; side pieces large, transverse, oblique.

Elytra not longer than the prothorax, truncate, and broadly rounded at tip, slightly imbricate at the suture, entirely without veins, except the usual subsutural one; epipleuræ not separated by a line, but with a series of large punctures along the lateral margin;

a faint triangular longitudinal impression is also seen inside of the humeri; five dorsal segments of the abdomen, and the angles of the one anterior to them, are exposed. Lower wings wanting.

Abdomen: dorsal surface flat, not margined at the sides, each exposed segment with a transverse row of small depressed bristles; spiracles situated near the hind angles of each segment, equidistant from the lateral and posterior margins; ventral segments slightly convex, six are visible behind the posterior coxæ, which conceal two segments and the base of the third. The ventral sutures are straight, with the exception of the last two, which are curved; the last segment is feebly bisinuate at tip.

Coxæ flat, not at all prominent; front ones small, subtriangular, with rounded angles; middle coxæ similar in form, but larger; hind coxæ very large, extending to the side margins of the body; outer surface flat; inner (or upper) surface with two obtuse prominences, one near the front margin, the other about the middle, serving for its firmer attachment.

Legs short; trochanters small, continuous with the outline of the thighs and on their inner face; thighs stout and compressed; tibiæ compressed, triangular, rounded at tip, armed externally with long spines; terminal spurs long, slender; front tibiæ shorter and broader than the others, being only one third longer than wide; hind tibiæ more than two and a half times as long as wide, with two small additional spines on the inner face, above the terminal spurs; tarsi five-jointed, a little longer than their respective tibiæ, slender, somewhat compressed, spinous beneath, front and middle pairs with joints 1-4 equal, in the ♂ with one row of claviform membranous appendages on each side, in addition to the spines; hind tarsi with the first joint longer than the second; articulations somewhat oblique beneath, spinous, but without membranous papillæ; last joint of all the tarsi one half longer than the fourth joint; claws moderate in size, simple.

Body ovate elongate, depressed, resembling at first sight a minute *Blatta*, a resemblance increased by the pale brown colour and somewhat translucent sides.

The only representative of this family known is a small brown insect 4 millims. long (*Platypsylla castoris*, Ritsema), found on the American Beaver. Two specimens, collected from the Beavers in the Zoological Gardens of Amsterdam, were most kindly sent to me by Mr. Ritsema, who, on learning that my opinion of the relations of the insect were quite different from those expressed by him, has, in the most courteous manner, authorized and, indeed, requested me to publish the results of my investigations as speedily as possible.

Specimens were sent by the late Mr. Denny to Prof. Westwood, who published a description of them about the same time, but a little later than the notice by Mr. Ritsema, under the name *Platypsyllus castorinus*. I owe to the courtesy of Professor Westwood an opportunity of making a hasty and somewhat superficial examination of his specimens during a visit in May 1871, when I stated my belief that this insect would have to be regarded as Coleopterous.

Mr. Ritsema regarded it as representing a family of the so-called suborder *Suctoria*, or *Aphaniptera*, equivalent in value to the *Pulicidæ*, or true fleas. Professor Westwood, on the other hand, viewed its organization as so peculiar that he established upon it a new order of insects, which he named *Achreioptera*.

After the detailed description given above of the separate organs, it seems hardly necessary for me to defend my opinion of the Coleopterous nature of this object, as against the views expressed by my learned colleagues. It will be better, by an analysis of the characters detailed, and a comparison of the different parts with familiar forms, to show that the peculiarity of *Platypsylla* consists rather in the assemblage of unusual and rare characters with a further modification and exaggeration of certain parts, indicating only family value or strange habits of life, than any thing of sufficient importance to warrant its reception as a distinct order. No differential characters for his new order were given by Professor Westwood; and without very decided modifications in the plan of the mouth, thorax, and wings, profoundly different from those seen in other orders, it would be very inexpedient to rate any species, however odd its appearance, as an equal to the great and important types in nature which are recognized as orders of insects.

The structure of the mouth, the size and mobility of the prothorax, the presence of elytra, the arrangement of the sternal surface, and the insertion of the legs, all forbid, in the most positive manner, its reference to the *Aphaniptera*, or any allied series of insects.

In comparison with other families of Coleoptera the mentum is altogether peculiar in form; but an approach to it is found in *Lep tinus*, a singular genus also subparasitic in its habits. It has been usually classed with *Silphidæ*; but in examining a species found in North America, I thought the form of the mentum, with other peculiarities, sufficient to warrant its reception as a distinct family, *Lep tinidæ* (Le Conte, Proc. Acad. Nat. Sc. Philadelphia, 1866, p. 368). The mentum, in fact, is large, subquadrate, and the hind angles are produced over the gula in long spiniform processes, the feebly developed analogues of the triangular wing-like processes of *Platypsylla*.

The ligula and labial palpi present nothing worthy of note; the maxillæ also are of not unusual form in various parts of the *Clavicorn* series; the strong corneous stipes and cardo resemble more nearly those of *Trichopterygidæ* than any other family.

The form of the mandibles is entirely that of *Corylophidæ*.

The labrum is peculiar from its great breadth as compared with its length. I do not remember to have seen any figure resembling it.

The head is peculiar in form, from the deep groove behind the occiput, between it and the front margin of the prothorax, and still more wonderful on account of the posterior comb of short, flat spines,—a beautiful adaptation to the habits of the animal, enabling it to glide always forwards amidst the dense fur in which it lives—a movement which is also facilitated by the fringes of hair on the hind angles of the head and prothorax, the edges of the sternal plates, and the long spines of the tibiæ.

The antennæ are only slightly modified from the irregular form seen in the *Gyrinidæ* and certain genera (*Parnus*, *Helichus*, &c.) of *Parnidæ*; the reception of the antennæ in cavities on the dorsal surface of the prothorax is a rare character, but occurs in *Physemus*, Lec., of the *Byrrhidæ*, *Mychocerus*, Er., of doubtful position, and again in a totally different genus, *Usechus*, Motsch., of the *Tenebrionidæ*. In all the genera mentioned the club of the antennæ is globose, and the cavities are round fossæ, near the front angles of the pronotum; their extension into grooves, longer than the antennæ themselves, as in *Platypsylla*, is the first instance known, and certainly one of the most remarkable characters of the genus.

The prothorax is not unusual in form, being somewhat like that of *Silpha*, with the addition only of the singular antennal grooves just mentioned; the transverse rows of punctures near the basal margin recall those seen in *Dytiscidæ* and *Gyrinidæ*.

The immense development of pro- and mesosternum is very similar to that of *Limulodes*, a very abnormal North-American genus of *Trychopterygidæ*; but, in addition, the metasternum is similarly and equally developed, a character peculiar to this family.

The coxæ are somewhat peculiar, feebly resembling those of *Gyrinidæ*; but the side pieces of meso- and metathorax are quite different from those of that type, and are strongly *Trichopterygidan* in their form. The hind coxæ of *Gyrinidæ*, moreover, are contiguous for a long distance on the inner margin (as is also the case in *Dytiscidæ* and *Amphizoidæ*); and the coxal articulation is quite different.

The elytra are similar to those of *Omalium* and many other *Staphylinidæ*, but are peculiar from the absence of distinct epipleuræ, a rare character in the first primary division of *Coleoptera*; the suture is slightly imbricated, though less so than in *Xantholinus* and allied genera of *Staphylinidæ*.

The abdomen presents nothing particularly worthy of mention, being similar to that of many *Staphylinidæ*; the concealment of the first ventral segments by the hind coxæ is remarkable. An approach to this arrangement may perhaps be observed in the so-called ventral plates of *Cyllidium* of the *Hydrophilidæ*.

The only peculiarity worthy of notice in the legs is that the front and middle tarsi of the ♂ are furnished with two rows of papillæ, or clavate, flat, membranous appendages, similar to those seen in various groups of the *Adephagous* series. Otherwise the legs are not very dissimilar to those of some genera of *Anisotomini* (*Cyrtusa*, *Colenis*, &c.), a tribe of *Silphidæ*.

It will be seen by the above analysis of characters that the affinities of this insect are very composite, but all in the direction of the *Adephagous* and *Clavicorn* series, though chiefly with the latter. The most convenient position of the family will probably be between *Hydrophilidæ* and *Leptinidæ* as the families are now arranged, though its tendency to *Trichopterygidæ* and *Corylophidæ* is equally strongly manifested.

It is therefore a very peculiar and extraordinary synthetic type, which is almost equally in and out of place in any linear arrangement of the series with which it is allied.

I must here return my sincere thanks to Messrs. J. Weyers and Roelofs, of Brussels, for their kind aid in obtaining and forwarding the specimens from Mr. Ritsema, and also to the Rev. A. Matthews for his friendly offer to dissect one of the specimens for my investigation—a task which he has accomplished with the same skill with which he made his wonderful dissections of *Trichopterygidæ*.

It is very probable that a family showing such varied relationships either was in former times, or is at present, widely diffused; and it is quite possible that, when looked for, similar Epizoa may be found upon other aquatic mammals. The European Beaver, the Capybara (*Hydrochærus*), and the Musk-rat (*Fiber zibethicus*) should particularly be examined for allied species.

The generic characters are contained in the exposition of structure given above, and, until other species are discovered, need not be separated from those belonging to the family.

PLATYPSYLLA CASTORIS, Ritsema.

Elongato-ovata, depressa, luteo-fulva, nitida, capite angulis posticis pilis longis fimbriato, occipite spinis brevibus depressis transversim uniseriatim pectinato; prothorace trapezoideo, antrorsum angustato, latitudine vix brevior, dorso parce punctato, lateribus obliquis pro receptione antennarum sulcatis, basi trisinuato, linea punctorum sinuato ante basin notato; coleopteris transversis, vage parce punctulatis, versus latera pubescentibus, impressione brevi basali intra humeros notatis; abdomine segmentis dorsalibus serie transversa breviter setosis.

Long. 4 millim.

Platypsilla castoris, Ritsema, Petites nouvelles Entomologiques, 1869 (Sept. 15); Tijdschr. voor Entomologie, 2nd series, v. p. 185.

Platypsillus castorinus, Westwood, Entomologist's Monthly Magazine, vi. p. 118 (Oct. 1869).

Collected by Mr. Ritsema on the American Beavers (*Castor canadensis*) in the Zoological Society's Gardens at Amsterdam.

DESCRIPTION OF PLATE LXVIII.

Fig. 1. Upper surface of *Platypsilla castoris*.

2. Under surface: *a*, prosternum; *b*, episternum, and *c*, epimeron of prothorax; *d*, mesosternum; *e*, cavity of middle coxa and side pieces of mesothorax; *f*, metasternum; *g*, cavity of hind coxa; *h*, hind coxa; *i*, base of hind femur.

The small front coxæ are nearly concealed by the broad process of the prosternum.

3. Head, with antenna, dorsal view.
4. Labrum, viewed from beneath.
5. Antenna.
6. Mandible, more highly magnified.
7. Maxilla.
8. Mentum, with ligula and labial palpi.
9. Anterior leg.
10. Anterior tarsus, more highly magnified, showing the series of membranous papillæ.
11. Hind leg, with coxa.

2. Synonymy of and Remarks upon Australian and Western
Polynesian Land-Shell. By J. BRAZIER, C.M.Z.S.
M.R.S.N.S.W.

[Received June 21, 1872.]

1. *HELIX* (*GEOTROCHUS*) *HERMIONE*.

1869. *Helix* (*Geotrochus*) *hermione*, Angas, Proc. Zool. Soc. p. 625, pl. 48. fig. 5.

1870. *Helix biocheana*, Crosse, Journ. de Conchyl. p. 249.

Hab. Bougainville Island, Solomon group.

A very pretty species, distinguishable from the black variety of *H. meta*, Pfr., by its invariably smaller size, by the presence of the straw-coloured band below the keel instead of next the suture, and by the last whorl being more distinctly keeled and less convex.

2. *HELIX* (*GEOTROCHUS*) *ADONIS*.

1869. *Helix* (*Geotrochus*) *adonis*, Angas, Proc. Zool. Soc. p. 624, pl. 48. fig. 4.

1870. *Helix metula*, Crosse, Journ. de Conchyl. p. 248.

Hab. Bougainville Island, Solomon group.

A delicately orange-coloured species, intermediate in form between *H. meta*, Pfr., and *H. gaertneriana*, Pfr.

3. *HELIX* (*RHYTIDA*) *VILLANDREI*.

1865. *Helix villandrei*, Gassies, Journ. de Conchyl. p. 210.

1869. *Helix* (*Rhytida*) *boydi*, Angas, Proc. Zool. Soc. p. 626, pl. 48. fig. 8.

Hab. Recherche Bay, San Christoval, Solomon Group (*coll. Brazier*).

Of this species I obtained two inferior specimens at the above locality when at the Solomons in 1865; since then they have been brought to Sydney by the island traders in countless numbers. When first described by Gassies this species was put down as being from New Caledonia; it was, however, carried there by the French missionaries, and thence taken to France.

4. *HELIX* (*VIDENA*) *BELLENGENENSIS*.

1871. *Helix bellengerensis*, Cox, Proc. Zool. Soc. p. 54.

1871. *Helix bellengenensis*, Brazier, Proc. Zool. Soc. p. 321.

Hab. Manarm Creek, Bellengen River, New South Wales (*coll. Brazier*).

This is a simple lenticular species, allied to *H. leucocheilus*, Cox, from which it differs in being more conical and more sharply keeled. It belongs to the subgenus *Videna* of H. and A. Adams.

5. *HELIX* (*MEROPE*) *NOVÆ HOLLANDIÆ*.

1834. *Carocolla novæ hollandiæ*, Gray, Proc. Zool. Soc. p. 67.

1852. *Helix dupuyana*, Pfr. Proc. Zool. Soc. p. 159.

1868. *Helix (Geotrochus) dupuyana*, Cox in Monograph of Australian Land-Shells, p. 66, pl. 2. fig. 5.

1852. *Helix dupuyana*, Reeve in Conch. Icon. sp. 354.

Hab. Ash Island, Hunter River, Wingham, Manning River, Scone, New England, Port Macquarie, Macleay, Nambuccra, and Bellengen rivers, New South Wales (*coll. Brazier*).

Specimens from the Bellengen are very large, a few that I collected measuring 17 lines in the greater diameter, and 13 lines in the lesser. A variety is also met with of a dark dirty yellow colour, with a dark chestnut band on the periphery. The specimens from the other localities are of smaller size and of a dark chestnut colour. At Port Macquarie it is found on high hills near the sea, under logs.

6. *HELIX (CALLICOCILIAS) COXI*.

1864. *Helix forbesii*, Cox, Proc. Zool. Soc. p. 40 (non Pfr.).

1864. *H. cerea*, Cox, Cat. Austr. Land-sh. p. 36 (non Gould).

1866. *H. coxi*, Crosse, Journ. de Conch. p. 195.

1868. *H. cerata*, Cox, Monograph of Australian Land-Shells, p. 58, pl. 8. fig. 4.

Hab. Port Molle and Port Denison, Queensland (*coll. Brazier*).

The ground-colour of this species is white; the epidermis is remarkably thin; and the shell has a waxy and rather glossy appearance, especially underneath. Found in great numbers on the trunks of the native fig-trees.

7. *HELIX (CONULUS) UMBRACULORUM*.

1864. *Helix umbraculorum*, Cox, Cat. Austr. Land-sh. species 136.

1864. *Helix wilcoxi*, Cox, Proc. Zool. Soc. p. 594.

1868. *H. wilcoxi*, Cox, Monograph of Australian Land-Shells, p. 9, pl. 4. fig. 12.

Hab. Clarence and Richmond rivers (*Macgillivray*); Macleay River, also Lassey's Island, Bellengen River, New South Wales (*Brazier*).

The first name given to this species Dr. Cox singularly ignores; and in his Illustrated Monograph there is no mention of its being a synonym. In the Proc. Zool. Soc. 1867, p. 723, we have the *H. umbraculorum* mentioned by him as being allied to *H. turriculata*, Cox.

8. *HELIX (CHAROPA) MIDSONI*.

1871. *Helix (Discus) atkinsoni*, Cox in Legrand's Collections for Monograph of Tasmanian Land-Shells, species 62, pl. 2. fig. 12.

Hab. Brown's River, Tasmania (*coll. Cox*).

The change in the specific name is necessary, as Theobald described an East-Indian species in Journ. As. Soc. Bengal, 1859, under the name of *H. atkinsoni*. I have named it after Mr. Midson, an enthusiastic collector in Tasmania.

9. *HELIX* (*CHAROPA*) *MILLIGANI*.

1871. *Helix* (*Videna*) *milligani*, Brazier, Proc. Zool. Soc. p. 698.

1871. *H.* (*V.*) *milligani*, Brazier, in Legrand's Collections for Monograph of Tasmanian Land-Shells, species 69, published in August, edition 2.

1871. *Helix* (*Charopa*) *scrupulus*, Cox in Legrand's Collections for Monograph of Tasmanian Land-Shells, species 76, published in September, edition 2.

Hab. Foot of Mount Wellington, Tasmania (*coll. Brazier*).

10. *HELIX* (*RHYSSOTA*) *SUBRUGATA*.

1851. *Helix subrugata*, Pfr. Proc. Zool. Soc. p. 259.

1852. *H. subrugata*, Reeve, Conch. Icon. sp. 773.

1860. *Nanina subrugata* (*Thalassia*), Albers, Heliceen, ii. p. 59.

1864. *Helix graftonensis*, Cox, Cat. Austr. Land-sh. sp. 137.

1864. *H. clarencensis*, Cox, Proc. Zool. Soc. p. 594.

Hab. South Grafton, Clarence River, New South Wales (*Brazier*).

This species was never found in New Zealand, as has been stated by Mr. Reeve in his 'Conch. Icon.,' upon the authority of the Cummingian collection. I obtained some hundreds of it in a few minutes, crawling on the ground and on small bushes after heavy rains, when at Grafton. It was also obtained by Mr. J. Macgillivray at the same place.

11. *TORNATELLINA JACKSONENSIS*.

1864. *Bulimus jacksonensis*, Cox, Cat. Austr. Land-sh. p. 25.

1868. *Achatinella* (*Frickella*) *jacksonensis*, Cox, Monograph of Australian Land-Shells, p. 77, pl. 12. fig. 15.

Hab. Darling Point, Shark's Bay; Botanic Gardens, Sydney, New South Wales (*Brazier*).

The other species described by Cox as *Achatinella wakefieldiæ*, from the Clarence and Richmond rivers, is also a *Tornatellina*.

12. *BULIMUS* (*CHONDRULA*) *ADELAIDÆ*.

1863. *Bulimus* (*Chondrula*) *adelaidæ*, A. Adams and Angas, Proc. Zool. Soc. p. 522.

1864. *Pupa ramsayi*, Cox, Cat. Austr. Land-sh. p. 28.

1868. *Bulimus* (*Napæus*) *adelaidæ*, Cox in Monograph of Australian Land-Shells, p. 69, pl. 13. fig. 5.

Hab. Flinders range, Rapid Bay, and Wallaroo, South Australia (*Masters*); Wombo, near Singleton, New South Wales (*Brazier*).

This species is very rare in New South Wales. I have one fine specimen, found at Wombo; but it is rather more elongated than the type from South Australia.

13. *BULIMUS* (*LIPARUS*) *BRAZIERI*.

1871. *Bulimus* (*Liparus*) *brazieri*, Angas, Proc. Zool. Soc. p. 19, pl. 1. fig. 28.

Hab. Stirling range, King George's Sound, under dead "grass-tree" (*Xanthorrhœa*).

This pretty longitudinally rugosely plicately ribbed species belongs to the same group as *B. angasiana*, Pfr., *B. baconi*, Benson, and *B. mastersi*, Cox, all from the S.W. region of the Australian continent. When I sent Mr. Angas the first specimens, I marked them Sinclair's range, in error, instead of Stirling range.

3. Notes on the Habits of the Churinche (*Pyrocephalus rubineus*). By W. H. HUDSON, C.M.Z.S.

[Received August 6, 1872.]

The Churinche (*Pyrocephalus rubineus*) is a common species in the neighbourhood of Buenos Ayres. Its brilliant plumage and remarkable song make it one of the best-known of our summer visitors. But the naturalist will find in the peculiarity of its migratory habits a far more interesting subject of contemplation. It is commonly called "*Churinche*," from its note; also "*Federál*," from its predominating hue being the favourite colour of the political party (now happily extinct) of that name. The Churinche appears about the end of September, and is usually first seen in localities to which the Tyrantbirds and Tæniopteras are also partial, such as low grassy grounds, with here and there a stalk or bush, and near a wood or plantation. Insects are most abundant in such places; and here the Churinche is seen, perched on a twig, darting at intervals to snap at the flies after the fashion of the Flycatchers, and frequently uttering his low, plaintive, and mellow note. This bird is very common in the woods along the Plata; every orchard on the pampas is visited by a few of them; and they are very abundant about Buenos Ayres city. Going south they become rarer; but, strange to say, a few individuals find their way to the shores of the Rio Negro, though before reaching it they must cross a high, barren country quite unsuited to them. The natives of the Carmen have no name for the Churinche, but speak of it as a bird wonderful for its beauty and seldom seen. Amongst the dull-plumaged Patagonian species it certainly has a very brilliant appearance.

A very few days after their arrival the Churinches pair; and the male selects a spot for the nest—a fork in a tree from six to twelve feet from the ground, or sometimes a horizontal bough. This spot the male visits about once a minute, sits on it with his splendid crest elevated, tail spread out, and wings incessantly fluttering, while he pours out a continuous stream of silvery gurgling notes, so low they can scarcely be heard ten paces off, and somewhat resembling the sound of water running from a narrow-necked flask, but infinitely more rapid and musical. Of the little bird's homely, grey, silent mate the observer will scarcely obtain a glimpse, she appearing as yet to take little or no interest in the affairs that so much occupy the attention of her consort, and keep him in a state of such violent excitement. He is exceedingly pugnacious; so that

when not fluttering on the site of his future nest, or snapping up some insect on the wing, he is eagerly pursuing other male Churinchés, apparently bachelors, from tree to tree. At intervals he repeats his remarkable little song, composed of a succession of sweetly modulated metallic trills uttered on the wing. The bird usually mounts upwards from thirty to forty yards, and, with wings very much raised and rapidly vibrating, rises and drops almost perpendicularly half a yard's space five or six times, appearing to keep time to his notes in these motions. This song he frequently utters in the night, but without leaving his perch; and it then has a most pleasing effect, as it is less hurried, and the notes seem softer and more prolonged than when uttered by day. About a week after the birds have come, when the trees are only beginning to display their tender leaves, the nest is commenced. Strange to say, the female is the sole builder; for she now lays by her indifferent mien, and the art and industry she displays more than compensate for the absence of those beauties and accomplishments that make her mate so pleasing to the sight and ear. The materials of which the nest is composed are almost all gathered on trees; they are lichens, webs, and thistle-down: and the dexterity and rapidity with which they are gathered, the skill with which she disposes them, the tireless industry of the little bird, who visits her nest a hundred times an hour with invisible webs in her bill, are truly interesting to the observer. The lichens firmly held together with webs, and smoothly disposed with the tops outside, give to the nest the colour of the bark it is built on.

After the Churinché's nest is completed, the *Ventiveo* (*Pitangus bellicosus*) and the common Blackbird (*Molothrus bonariensis*) are the troublers of their peace. The first of these sometimes carries off the nest bodily to use it as material in building its own; the female Blackbird is ever on the look out for a receptacle for her eggs. Seldom, however, does she succeed in gaining admittance to the Churinché's nest, as he is extremely vigilant and violent in repelling intruders. But his vigilance at times avails not; the subtle bird has watched and waited till, seizing a moment when the little scarlet tyrant is off his guard, she drops her surreptitious egg into his nest. When this happens the Churinchés immediately leave their nest. The nest is sometimes lined with feathers, but usually with thistle-down; the eggs are four, pointed, and spotted at the great end with black; usually each egg has also a few large grey spots. The young are at first grey, marked with pale rufous, but soon become entirely grey, like the females. In about a month's time the belly of the males begins to assume a pale mauve-red; this spreads upwards towards the breast and throat; and finally the crest also takes on this colour. The Churinchés raise two broods in a season—but if the nest is destroyed, will lay as many as four times.

The Churinché is the first of our summer visitors to leave us. As early as the end of January, and so soon as the young of the second brood are able to feed themselves, the adults disappear. Their going is not gradual, but they all vanish at once. The departure of

all the other migratory species that visit us in summer takes place after a very sensible change in the temperature; but at the end of January the heat is unmitigated—it is, in fact, often greater than in the solstice. Thus the Churinche disappears nearly three weeks before the Swallows (the first birds, excepting him, to leave us); and yet he reappears simultaneously with them.

When the adults have gone, the silent young birds remain. In a month's time the sexes of these may be distinguished. After another month the males are heard at times to sing, and are frequently seen pursuing each other over the fields. It is only at the end of April, three months after the old birds have gone, that they also take their departure. How remarkable it is that so long a time should elapse between the departure of the old and of the young birds, when so many other species migrate at the same time with their offspring! The adult Churinche leaves us three weeks before the adult *Progne chalybea*, the young Churinche nine weeks after the young *P. chalybea*. The autumn cold, storms, and frosty nights seem to be the immediate cause of the young birds' departure; but in the departure of the adults migration appears to be an instinct quite independent of atmospheric changes.

4. Descriptions of some new Starfishes from New Zealand.

By Captain F. W. HUTTON, C.M.Z.S.

[Received August 7, 1872.]

Fam. OPHIURIDÆ.

OPHIOTHRIX CÆRULEA, sp. nov.

Disk pentagonal, the sides with reentering obtuse angles; radial shields naked, shagreened, the outer corner curved upwards, each pair separated by three rectangular plates, bearing one or two long tapering rough spines; centre of disk and a band between the pairs of radial shields covered with small scales, each bearing a single spine.

Rays about four times the diameter of the disk; under ray-plates cordate, with the point inwards and truncate; upper ray-plates rather broader than long, the sides produced into angles and bent down; spines arranged three in a row, longer than the breadth of the ray, tapering and strongly spinous.

Mouth-shields rhomboidal; tooth-papillæ three in a row, except the lowest, which has only two.

Colour pale blue, with a band of purplish white, edged with purplish black down the centre of the upper surface of the rays; under surface of the rays white; disk mottled with purplish; mouth-papillæ yellowish.

About 3 inches from the tips of the rays.

Two specimens are in the Colonial Museum, but without locality.

OPHIONEREIS FASCIATA, sp. nov.

Disk round ; radial shields small, half covered, parallel, distant ; scales small, larger near the margin.

Rays five to six times the diameter of the disk ; under ray-plates squarish, outer edge straight ; upper ray-plates rectangular, broader than long, outer edge concave ; spines in three or four rows, rounded, slightly tapering, about equal in length, rather longer than the breadth of the ray ; tentacle-scale large, rounded, oval.

Mouth-shields broadly ovate ; mouth-papillæ small, round, and blunt, four on each side.

Colour yellowish white, the rays banded above and below with purplish black, and the disk irregularly marked with the same colour ; mouth-shields black ; mouth-papillæ white.

About 5 inches from the tips of the rays.

Cook's Straits, on rocks below high-water mark (*F. W. H.*), and the Chatham Islands (*H. H. Travers*).

OPHIACTIS NIGRESCENS, sp. nov.

Disk rounded ; radial shields narrow, oblong, widely diverging, shagreened ; remainder of disk covered with small scales bearing short round spines, giving them a granulated appearance.

Rays about six times the diameter of the disk ; under plates broader than long, with the inner and outer margins convex, and the lateral margins concave ; upper plates wedge-shaped, the point inwards and truncate, outer margin convex ; spines four in a row, cylindrical, with blunt points shagreened, the upper one much larger than the others, and longer than the breadth of the ray.

Mouth-shields oblongo-pentagonal, the point outwards, and narrowed inwards.

Colour brownish black.

About 6 inches from ray to ray.

Several specimens are in the Colonial Museum ; but the locality is not stated.

OPHIURA CYLINDRICA, sp. nov.

Disk subpentagonal, granulated.

Rays from three to four times the diameter of the disk, scarcely tapering, and rather flattened above ; lower ray-plates longer than broad, outer edge convex ; upper ray-plates convex on the outer edge and tapering inwards, nearly as long as broad ; side plates with six equal, rather pointed, short spines, which do not cover half of the next plate.

Mouth-shields irregular, cordate or lenticular, sometimes obsolete ; side mouth-shields the same ; mouth-papillæ 6-8, the two outer ones broader.

Colour pale yellowish brown ; rays with dark brown transverse bands, edged with black, on the upper surface ; disk spotted and mottled with the same.

About 3 inches from the tips of the rays.

Two specimens are in the Colonial Museum, locality not stated.

Fam. ASTERIADÆ.

ASTERIAS MOLLIS, sp. nov.

Rays five, broad, rounded, tapering, their length between three and four times the width of the disk ; spines single, acute, in longitudinal rows on the rays, but irregularly placed on the disk ; about nine rows of spines on a ray, the two lowest on each side placed close to the ambulacra, the outer of the two composed of longer spines ; ambulacral spines shorter, in two rows.

Diameter about four inches.

Two specimens in the Colonial Museum, with dredgings, but locality not stated.

ASTERIAS SCABER, sp. nov.

Rays seven, rounded, tapering, their length from three to four times the width of the disk ; upper surface covered with granular tubercles, which have occasionally a spine in the centre ; six rows of spines on each ray, the two lowest on each side placed close to the ambulacra, the upper on the side of the ray ; occasionally an interrupted row of spines along the top of the rays ; ambulacral spines slender, in two rows.

Diameter about 6 inches.

Two specimens are in the Colonial Museum, among dredgings, with the last, but no locality stated.

Fam. PENTACEROTIDÆ.

PENTACEROS RUGOSUS, sp. nov.

Rays as long as the disk ; centre of disk and a line along each ray raised (dry) ; upper surface covered with flat granular plates, arranged in a row down the centre of each ray, but irregularly on the other portions ; marginal shields $\frac{2}{5}$ from ray to ray, covered with minute blunt rough spines.

About 4 inches in diameter.

Allied to *P. granulatus* ; but the rays are more pointed, the dorsal plates are flat-topped, and all the granules are of equal size.

Two specimens in the Colonial Museum, locality not stated.

Fam. ASTERINIDÆ.

PTERASTER INFLATUS, sp. nov.

Pentagonal, with five radiating ribs, which are ovate and swollen on the inner half, and slightly convex on the outer half ; centre of disk hollowed ; margin thin, sharp ; back tessellated with smooth flat tubercles, getting smaller towards the margin, where they are granulated ; on the rays they are large and irregularly placed, but showing a tendency to arrange themselves along the rays ; lower surface with short simple blunt spines, pointing inwards ; webbed ambulacral spines short, not much longer than the ambulacral spines.

Colour reddish (dry). Diameter $5\frac{1}{2}$ inches.

A single specimen is in the Colonial Museum, locality not stated.

5. Notes on Chinese Mammalia observed near Ningpo. By
R. SWINHOE, F.Z.S., H.B.M. Consul at Ningpo.

[Received September 24, 1872.]

We appear to have two species of *Cervulus* in our district:—one ranging to the south, and seemingly the *C. reevesi*, J. E. Gray; and the other to the north, and abounding about the hills to the back of Hangchow city. The former is much more rarely brought to this market than the latter, and would appear to be very scarce within our range: only two were brought in last winter, and both of these females; while of the latter numbers arrived, and of both sexes. The Chinese do not distinguish them.

The first example of *Cervulus* obtained had all the characters of a *C. reevesi* of South China and Formosa about four months old, and was the first Deer I procured here. I naturally supposed that it was of the ordinary species, which the people here call the “venison” of their hills. But what was my delight to have soon afterwards two bucks brought in, with yellow heads, showing a species quite new to me. It then remained a question whether the former was not the female of the latter; but I soon found this could not be, as the new species was more porcine in form, had shorter body and legs, and a shorter and higher head: but for a long time I could neither get the male of *C. reevesi* nor the female of the new species. At last females of the latter flowed in, and one spotted fawn. This last was a clencher. Years ago I procured a specimen of the young of *C. reevesi*, which is now in the British Museum, and it bore no signs of spots. The flat skin of the young of *C. vaginalis* that I got in Hainan, now also in the British Museum, had only a line of small yellowish spots on either side of the dorsal ridge (see P. Z. S. 1869, p. 653, where it is by mistake described as the skin of the fawn of *Panolia eldi*). The spotted young of the present species I hailed with particular delight, as I could not but believe that I had got hold of a veritable *Cervus*; but on close examination I found it to be no other than the fawn of a *Cervulus*. I have jotted the following description of its appearance:—

Fawn about six weeks old.—Hair softer, longer, and more woolly than in adult, especially about the cheeks, neck, and breast; coloured like the female, with but very little black mottling about the back and no black on the legs. Its sides have three sets of yellowish spots:—one on each side of the back running in continuous series from the middle of the hind neck to the tail, distant $1\frac{1}{2}$ inch across the back; another from the shoulder, the spots at first coalescing, and on the haunch scattering; another set below this again, more interrupted and scattered. The spots are of the size of a good-sized pea; but their arrangement on the two sides of the animal do not entirely agree.

I would ask leave to dedicate this species to the Secretary of this Society, who has long devoted himself to the special study of this group.

CERVULUS SCLATERI, sp. nov.

Measurements of a Horned Buck.

Muzzle to root of tail 2 ft. 10 in. ; tail $6\frac{1}{2}$ in.

Height at shoulders 19 in., at rump 20 in.

Girth of neck 14 in., of body behind shoulders $21\frac{1}{2}$ in., of ditto before thighs $17\frac{1}{2}$ in.

Length of head 8 in. ; nostril to rise of pedicle 2.6 in. ; of pedicle 5.8 in., of horn beyond 2.5 in.

Muzzle to fore angle of the eye 4 in. ; eye 1 in. across, with a deep sunken fosse of about same length in front.

Ear : length 3.5 in. ; greatest breadth 2 in. ; between ears 2 in.

Height of head taken behind eye 4.5 in.

Girth of muzzle $7\frac{1}{4}$ in., behind eye $13\frac{1}{4}$ in.

From elbow to tip of fore foot $11\frac{1}{2}$ in., from knee to tip of hind foot 9 in.

Hoof-toes .9 in. each, curved towards each other, with the under surface flat or somewhat bulging.

Horn-pedicle rounded on upper surface above forehead, and lying back parallel to ear, which extends rather beyond tip of horn. The horn is round and broad at base, narrowing to tip and slightly curved inwards, with a ring of tubercles round the edge of the base and a large tubercle-like tine given off inwards. In a more mature animal this is larger, but it does not seem to form into a distinct tine as in *C. reevesi*.

Hind neck, back, and rump yellowish chestnut, finely mottled with black. From nostrils above to angle of horn-pedicles brown ; along upper surface of pedicle a deep black line ; in front and round eye light yellowish chestnut, freckled with black ; chin white ; rest of head, including ears, chestnut-buff, the latter fringed internally and thinly dotted with white. Under neck and breast, and down the inside of fore leg, light chestnut-buff. Sides of body and belly washed with black, which deepens on the fore legs and becomes rich black on the soles between the toes ; under tarse deep reddish brown. Abdomen light chestnut, nearly naked in front and between the thighs ; inside of thighs, between legs, and under tail pure white ; upper surface of tail, hind border of buttocks, front edge of thighs, and under surface of tibiæ rich deep chestnut ; rest of hind legs chestnut-brown, with black feet and hoofs. Hair for the most part stiff and straight, grey for greater part of length, the tips only being coloured. The white hair white throughout.

The above description is taken from the two animals, the larger of which weighed about forty pounds when fresh. I have also sent home a younger buck, with the tips of the horns only showing. The skeleton sent corresponds to this in age ; and you will see that the horn-tip is merely a continuation of the pedicle, which, no doubt, shortens down to under cover of the fur-skin before the proper horn sprouts. You will observe from the skulls that as the animal grows older the pedicle shortens in length, and becomes stouter, especially near the hind part of the orbit. The lachrymal sinus also enlarges with age.

The females, of which I send two adult skins, in colour resemble the males, but have a black horseshoe-shaped patch on the forehead, the ends of the shoe running down the forehead, and overrunning the dark fleshy slit of the supraorbital furrow. In one the fore belly is rather dark.

The female of this new species might easily be confounded with that of *C. reevesi*; but the brighter colour of the latter, and her pure white chin and throat, will serve as distinguishing characters for the skin. In life, too, the latter stands distinct in displaying a longer body and limbs, has longer ears, and generally a lighter and more Antelope-like form, instead of the more porcine appearance of the new species.

Sclater's Muntjac is generally brought into this city alive, but nearly always more or less mangled about the feet, from the traps employed by the natives to catch them. The weather is also very cold at the time, and I know of no one here succeeding in keeping them alive. I bought several during the winter, but they all died within a few days of their captivity. They are extremely shy and timid, and cannot be induced to eat. We have also been very unsuccessful in rearing the spotted young.

On the mountain-ranges that separate this Province of Chekiang from the neighbouring Province of Ganhwuy a spotted Deer is found of about the size of the Axis, and, I suppose, the continental analogue of the Formosan *C. pseudaxis* (*taivanus*). The first intimation I received of its existence was in having a pair of horn-buds on a bit of frontlet brought me by a native, for which he wanted £5, the velvety budding being a valuable Chinese medicine. The hair on the short pedicles was yellowish red, with a pure white border round the buds. Père Heude, of the Society of Jesuits at Sikawei, near Shanghai, who travels about the country collecting natural-history specimens for a museum they are about to erect in their establishment, told me that he also knew of its existence, and was further informed that Fokien hunters came yearly to Ganhwuy to hunt the bucks for their velvet. I have heard also from sportsmen at Shanghai that they have occasionally seen antlered Deer when on the hills at some distances from Shanghai; but up to the present I have sought the spotted Deer in vain.

While on the subject of Deer it would be as well to add what further information I have acquired about the Shanghai River-Deer,

HYDROPOTES INERMIS, Swinhoe.

This Deer is yearly becoming more numerous. It used to be confined chiefly to the marshy neighbourhood of Chinkiang, but is now found in moist grounds at no great distance from Shanghai. It is brought in large numbers to the Shanghai market during the winter months; and as many as thirty may be seen hanging up for sale at the same time. There can be no doubt of its great prolificness. The sportsmen in Shanghai all confirm the statement that I reported before, that the doe has many young at a birth. Mr. H. B. Russell, in the Imperial Customs at Chinkiang (son of Dr. Russell of the

'Times'), kindly undertook to question on this subject a friend of his there, who had had much experience in the pursuit of this Deer. He writes me:—"The gentleman I referred to tells me he has frequently found as many as four, five, and six young ones in a Deer; and you may be quite certain this information is correct." A gentleman at Chinkiang kept a pair alive running about in an unused compound for some time, but they never bred; but Père Armand David, who was here a few days back, assured me that a French friend of his at Shanghai had a pair of adults with two fawns, all alive and well. M. David has sent skins and skeletons to the Museum at the Jardin des Plantes. The tusks in the adult male grow to a large size, measuring fully two inches in length, and are, curiously enough, quite loose in their sockets, moving forwards and far backwards, and even a little sideways. A long tuft of hair from the lower lip, immediately behind the tusk, forms a cushion for it to rest against; but the tooth is pressed backwards beyond this, and becomes almost hidden by the hair of the chin. The tusks are kept more frequently in this depressed state than erect in fang-form. The use of these tusks, people here declare, is for digging up roots to feed on; but as they are only possessed by the male, it is more probable that their intention is for offence and defence. The muscular power the animal has over them must give the teeth extra power and direction in use, as well as afford a means of protecting them, by admitting of their being withdrawn under cover of the bristly hair. Nevertheless they are very frequently found clipped or broken. The Chinese extract the tusks to make ornaments of. Finding them so often missing, and from the fact of their looseness when present, I was inclined to think that they were deciduous, like the antlers in the horned species, to which they correspond; but an examination of the base of an extracted tusk showed that such could not be. I am sending home a skeleton and two skins. I procured two fine bucks from Chinkiang during last winter; and as in my first description of this animal I described from the skin of an animal only two-thirds grown, I may be allowed to add the measurements of an adult.

Adult Male.

Muzzle to root of tail 3 ft.

Tail, root to tip of terminal hairs 4 in.

Height at shoulders 1 ft. 10 in., at rump 2 ft. 10 in.

Girth of neck $11\frac{1}{2}$ in., behind shoulders 1 ft. 9 in., before thighs 1 ft. 9 in.

Length of head $7\frac{1}{2}$ in.

Upper lip, outer surface to rictus angle, 2 in.

Tusk 2 in., its breadth $\cdot 45$; quite loose.

Muzzle, tip to fore angle of eye $3\frac{1}{2}$ in.

Eye, from angle to angle, $\cdot 85$.

Lachrymal-fosse skin $\cdot 35$.

Ear: long $4\cdot 7$; its greatest breadth $2\frac{1}{2}$; between ears $1\cdot 7$.

Height of head behind eye 4.

Girth of muzzle 7 in., of head behind eye $11\frac{1}{4}$.

Elbow to tip of fore foot 1 ft. $3\frac{1}{2}$ in.

Carpal joint to ditto $8\frac{3}{4}$ in.

Knee to tip of hind foot $19\frac{1}{4}$ in.

Tarsal joint to ditto $11\frac{1}{4}$ in.

These animals are light brown, speckled minutely with black in winter ; as the spring advances, their heads, necks, and the fore part of their bodies lose the speckling and become light chestnut or yellowish brown. Hair on the crown short, thick, and close, a yellow scurfy substance being often abundant at the roots of the hair. The frontal skin shows no fleshy mark above the supraorbital furrow.

I learn from Mr. Russell that the fawn is spotted with dark brown spots all over the hind quarters.

From the boundary hills whence came the deer-horns was brought the skull of a magnificent Tiger (*Felis tigris*). The skull is one of the largest I have seen. A skin which I saw was of the short-haired southern breed.

Leopards (*Felis pardus*) have also been brought thence—the gutted carcass dried, with the skin enwrapping it (that is to say, attached to the forehead, feet, and tail) and in a fine state of preservation. How the body could be so thoroughly dried without injuring the skin was surprising. The hunters said that without the skin it would be hard to persuade purchasers of the genuineness of the article. They wanted seventy dollars for each entire animal. I told them I wanted the skulls of some Leopards. Some months after, they brought them to me, having sold the bodies and skins. They were of the ordinary species, the same that I procured at Canton (see P. Z. S. 1870, p. 628).

Viverricula malaccensis and *Mustela sibirica* are too numerous even within the city wall, destroying our poultry ; and in addition to these two pests we have the Himalayan Ichneumon (*Urva cancrivora*, Hodgs.), which, living in abundance on the crab-frequented shores of a lake not far from here, is attracted by the crabs of our briny river to the neighbourhood of our houses, and there soon gains a taste for poultry and their eggs. *Viverra zibetha* has been shot among the bushes at the foot of our hills ; and Père David, who was here from March to May, shot a *Paguma larvata* from the branch of a high tree near Hangchow. One *Nyctereutes procyonoides* was brought me by a hunter during the winter.

The Otter that frequents our lake I have procured a specimen of, and am sending it home, together with its skeleton. It seems to me darker on the under parts, and to have a narrower and deeper skull than *Lutra chinensis*, Gray. It may possibly be *L. swinhoei*, Gray. It is impossible to do any thing with the Otters without a series of good skins and skulls.

My bird-preserver brought three young Badgers here ; and I bought one the other day at Shanghai, whither the country-people bring them to sell to our sportsmen to bait with dogs. It seems to be of the ordinary Chinese species, *Meles leptorhynchus*, A. M.-E. (*M. chinensis*, Gray) (see P. Z. S. 1870, p. 622).

Our woods resound with the metallic-sounding “chic-chic-chic-
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chuck-chuck" of a Squirrel coloured a good deal like our South-China and Formosan Squirrel, but certainly distinct. It must be either the *Sc. griseipectus* or *Sc. chinensis*, both of J. E. Gray, or new. I have sent home a series of specimens with a separate skull or two; but it will be as well to give a sketch of it*.

I describe from a full-grown male with largely developed testes, about two-thirds the size of *Sc. castaneiventris* of South China, with lighter and greyer coat, pale buff belly, and broad puffy tail.

Teeth rich buff. Upper parts, head, breast, and legs olive-grey, finely tipped with black; yellower on the crown, back, rump, and tail; the latter very puffy, its hairs long, standing out clear of one another, each alternately ringed with black and olive-yellow, so as to give the appearance of longitudinal black stripes; the hairs at the tip of the tail black, with pale ends. Axillæ, belly, and inside of thighs light chestnut-buff (this varies in intensity in different individuals). Soles deep flesh-brown; claws black, with pale tips.

Length from snout to tip of tail $16\frac{1}{2}$ inches, of body without head $6\frac{1}{4}$, of tail 8, of head $2\frac{1}{2}$. Breadth between ears 1.3; depth of head 1.5. Height of ear .9; breadth of ear .6. Elbow-joint to end of toes 2.7. Tarsal joint to end of hind toes 2.1. Moustache bristles long and black. Eyes blackish brown. Ears rather short and somewhat rounded, clothed with short hairs. Scrotum black, and for the most part bare. Hairs of tail 2 inches long.

Père Heude spoke to me of a small striped *Glis* he had seen among the trees of our mountains. This will probably be the little rat-tailed *Sciurus m'clellandi*, which has such an extensive range in Southern China. I have not, however, met with it in this neighbourhood.

I am told the Rat of this place is small and peculiar, and not the *Mus decumanus*; but it appears to be scarce, and I have not yet got a specimen. A female of our red Field-Mouse, *Mus ningpoensis*, Swinh. (P. Z. S. 1870, p. 637), was brought to me while up country the other day, together with its nest and four little ones. The nest was laid at the bottom of a hole, and was composed almost entirely of the soft, silvery, silky, spikelets of a common grass (*Imperata koenigii*, Beauv.), intertwined with a few fibres of dried grass, as soft and warm as a feather-bed. The young had their eyes just beginning to open.

Sorex myosurus is here. I picked up an adult male in the garden that had been killed by dogs; but I have a little gem of a species caught by Mr. T. W. Kingsmill in his own garden at Shanghai. I have not seen any thing like it before.

I will finish this record of local Mammalia by noting that last September we disturbed some Bats in a ruin and secured one. It turned out to be *Phyllorhina swinhoei*, Peters (P. Z. S. 1870, p. 616); and on my last trip up country a countryman brought me four specimens of a light reddish-brown species, which, from its leaf-nose, also seems to be a *Phyllorhina*, and very probably of an undescribed species.

* A living Squirrel received from Mr. Swinhoe on the 9th of November appears to me to be *Sciurus griseipectus*.—P. L. S.

November 19, 1872.

The Viscount Walden, F.R.S., President, in the Chair.

Mr. Selater called the attention of the Meeting to the two Livingstone expeditions into Inner Africa now in preparation, and urged the importance of endeavouring to have zoological collections made in the countries about to be visited by them.

The following papers were read :—

1. Additional Notes on the Breeding of the Hippopotamus in the Society's Gardens. By A. D. BARTLETT, Superintendent of the Gardens.

[Received November 17, 1872.]

Since the publication of my notes in the 'Proceedings' of the Society for 1871 (p. 255 *et seqq.*) two opportunities have been afforded me of making observations upon the breeding of the Hippopotamus, and I have some additional remarks to offer upon this subject.

The subjoined table gives the dates of the last copulation which took place in each case before the birth of a young one in the Society's Gardens, together with the dates of birth, showing the period of gestation and the number of days. In these some differences appear to have occurred; but I believe the dates to be correct, and to have been carefully noted by the keepers. It is, however, possible that trifling errors may have been made.

	Sex of young.	Date of last Copulation of parents.	Date of Birth.	Period of Gestation.
I. . . .	♂	June 29, 1870	Feb. 21, 1871	237
II. . . .	♀	May 27, 1871	Jan. 7, 1872	227
III. . . .	♂	March 9, 1872	Nov. 5, 1872	242

About 12 o'clock A.M. on the 4th of November 1872, I observed that the female Hippopotamus was showing symptoms of displeasure at being looked at; and as many of the visitors were expecting she was about to bring forth her young one, they lingered longer in front of her den than usual, and this watchfulness on their part annoyed her. Seeing this, I at once closed the house, and gave instructions not to allow any one to go *near her*, or to *be seen by her*; in fact, the most perfect quietness was immediately put in full force: and I have no doubt the easy delivery of the young one was due principally to the very strict and faithful manner in which the two keepers (Prescot and Thomson) carried out my wishes; for soon after the house was closed she settled down, and remained undisturbed until about 7 o'clock the next morning. At fifteen minutes past seven the young one was born; and the condition of the female upon this occasion differed greatly from her former state, described in the notes before referred to.

She was perfectly quiet; and the young one walked about soon

after its birth, and in the course of three or four hours was seen sucking. The sucking at first took place when the female was lying partly on her side, and was of short duration; and the young one wandered up and down by her side evidently looking for food. The mother soon went into the water, followed by the young one; and here they passed a considerable time. When she left the water she was closely followed by the little one; and it was generally after leaving the water that the young one sucked. We now observed the female stood up with her back raised and arched, while the little one would lie down under her teats and suck for a considerable time; and so freely did the milk come from the mother that the face of the young one was sometimes quite white with it.

Notwithstanding these favourable conditions, we had the greatest difficulty in approaching the female Hippopotamus to give her food or to clean out the den, so savage did she become on the entrance into the house even of her keeper. The furious champing of her jaws, the rushing forward against the iron bars, and smashing about, caused us much alarm lest she should injure the young one during these moments of fury; in fact, upon one or two occasions she opened her ponderous jaws in a threatening manner at the little one, and made us tremble for its safety. It was a great relief, however, to find how very little the young one seemed to mind her threats; for it soon commenced to open its mouth as wide as possible, and threaten its mother.

The time thus passed on until the morning of the 12th. This morning I was surprised to find the two keepers in her house, standing in front of her den, while she was engaged eating her food as tamely and quietly as it was possible for her to be, the young one not as usual by her side, but altogether out of sight. The men called to me, as I entered the building, and expressed their sad and melancholy looks by telling me that the young one was dead—for they had been in the house some time at work, and no young one could be seen in or out of the water,—and, moreover, that the mother had probably killed it, as she was feeding, apparently glad to be no longer troubled about it. Not feeling certain that they had been careful enough in watching the tank, in which they supposed the dead young one to be lying at the bottom, I went close to the side of the tank, and looked with the most anxious care for the slightest ripple in the water. The corners and every part were closely watched for upwards of five or six minutes without discovering any signs of life.

I consulted with the men what it would be best to do; and we determined to let the water out of the tank, as it appeared to us useless to allow the then supposed defunct beast to lie at the bottom any longer. Therefore, in order to remove the plug to empty the tank, the iron gate must be closed; and this was about to be done. No sooner, however, than the mother saw the gate was being closed, she rushed at it, forced it back, and passed into the water, uttering her loud roaring grunt, and diving about in the tank. To our utter astonishment up came the head of the little one, shaking the water out of its ears, and looking as if just awake.

We left the house astounded and bewildered, looking at each other, and wondering if our eyes and other senses would agree upon comparing notes of what had happened. I am perfectly certain, and I have two trustworthy witnesses who are as positive as myself, that the young Hippopotamus must have been under water without the opportunity of taking breath for at least fifteen minutes. I may mention that the adult Hippopotamus has been timed, when under water, by a great number of very careful observers very many times, and on no occasion has it remained below above three and a half to four minutes without taking breath. This long continuance under water by the young animal induces me to believe that in the first few days of its existence it takes its nourishment, or part of it, from the teats of its mother under water.

Within the last twenty-four hours, I find the little one takes rest in the manner described by African travellers, viz. on its mother's back. Both yesterday and again this day the little one has been lying lengthwise on the broad shoulders of its mother, its little head reaching halfway up her neck. During this time she was floating in the water; and no doubt in a state of nature the young are carried about in the rivers by their parents in this manner. The young one already appears willing to feed itself, and, I am inclined to think, will do so in a few days. It is extremely lively, and not only playful, but opens its mouth in a threatening manner at the keepers. This habit has only been observed the last day or two; for at first on the least alarm it used to rush into the water for safety.

2. Note on the Placenta of the Hippopotamus.

By A. H. GARROD, B.A., F.Z.S., Prosector to the Society.

[Received November 19, 1872.]

Not knowing of any description of the placenta of *Hippopotamus amphibius*, I think it desirable to record the condition of that obtained after the birth of the calf, which occurred on the 5th of this month.

The placenta is a long cylindrical bag, three and a half feet from end to end and one and a half foot across. There is only one aperture; and that is not more than a foot long, and is situated at one of the ends. The other end is rounded, and quite complete. It is evident that the whole viscus is much the shape of the enclosed foetus, and must have closely covered it. The end at which the rupture had occurred, that is the one situated at the os uteri, is a little constricted, as may be inferred from the above statement of its diameter. The umbilical cord is attached to the placenta at one of the sides, about halfway between the two ends. It is one foot and a half long, and ragged at its free extremity. It is an inch and a half in diameter in the middle, and gets larger as it approaches its attachment, near which there are many spherical bodies, as big as peas and yellow in colour, supported on short amniotic pedicles. The outer surface of the whole viscus is covered uniformly with villi

of a bright red colour; and there is no reduction of their number, nor in their size, at the cæcal end at all. At the lacerated extremity, close to the rupture they are paler and more scattered. The walls of the viscus are of uniform thickness, except for a few inches round the point of attachment of the cord, where the vessels commence to diffuse themselves.

When received, the whole sac was turned inside out; and this was probably the result of the gradual contraction of the uterus from fundus to orifice. It may be remarked that for a few days after the birth of the calf, the mother had a considerable prolapse of the vagina, which gradually diminished, and is now very slight.

3. On the Habits of the Vizcacha (*Lagostomus trichodactylus*).

By W. H. HUDSON, C.M.Z.S.

[Received September 10, 1872.]

The Vizcachas in the pampas of Buenos Ayres live in societies, usually numbering twenty or thirty members. The village (called here "Vizcachera") is composed of a dozen or fifteen burrows or mouths; for one entrance often serves for two or more distinct holes. Often, where the ground is soft, there are twenty or thirty or more burrows in an old vizcachera; but on stony, or "tosca," soil even an old one may have no more than four or five burrows. They are deep wide-mouthed holes, placed very close together, the entire village covering an area of from 100 to 200 square feet of ground.

The burrows vary greatly in extent; and usually in a vizcachera there are several that, at a distance of from 4 to 6 feet from the entrance, open into large circular chambers. From these chambers other burrows diverge in all directions, some running horizontally, others obliquely downwards to a maximum depth of 6 feet from the surface: some of these burrows or galleries communicate with those of other burrows. A vast amount of loose earth is thus brought up, and forms a very irregular mound, 15 to 30 inches above the surrounding level.

It will afford some conception of the numbers of these vizcacheras on the settled pampas when I say that, in some directions, a person might ride 500 miles and never advance half a mile without seeing one or more of them. In districts where, as far as the eye can see, the plains are as level and smooth as a bowling-green, especially in winter when the grass is close-cropped, and where the rough giant-thistle has not sprung up, these mounds appear like brown or dark spots on a green surface. They are the only irregularities that occur to catch the eye, and consequently form an important feature in the scenery. In some places they are so near together that a person on horseback might count a hundred of them from one point of view.

The sites of which the Vizcacha invariably makes choice to work on, as well as his manner of burrowing, adapt him peculiarly to live and thrive on the open pampas. Other burrowing species seem

always to fix upon some spot where there is a bank or a sudden depression in the soil, or where there is rank herbage, or a bush or tree, about the roots of which to begin their kennel. They are averse to commence digging on a clean and level surface, either because it is not easy for them where they have nothing to rest their foreheads against while scratching, or because they possess a wary instinct that impels them to place the body in concealment whilst working on the surface, thus securing the concealment of the burrow after it is made. Certain it is that where large hedges have been planted on the pampas, multitudes of Opossums, Weazels, Skunks, Armadillos, &c. come and make their burrows beneath them; and where there are no hedges or trees, all these species make their kennels under bushes of the perennial thistle, or where there is a shelter of some kind. The Vizcacha, on the contrary, chooses an open level spot, the cleanest he can find to burrow on. The first thing that strikes the observer when viewing the vizcachera closely is the enormous size of the entrance of the burrows, or, at least, of several of the central ones in the mound; for there are usually several smaller outside burrows. The pit-like opening to some of these principal burrows is often 4 to 6 feet across the mouth, and sometimes deep enough for a tall man to stand up waist-deep in. How these large entrances can be made on a level surface may be seen when the first burrow or burrows of an incipient vizcachera are formed. It is not possible to tell what induces a Vizcacha to be the founder of a new community; for they increase very slowly, and furthermore are extremely fond of each other's society; and it is invariably one individual that leaves his native burrows to make a new and independent one. If it were to have better pasture at hand, then he would certainly remove to a considerable distance; but he merely goes from 15 to 50 or 60 yards off to begin his work. Thus it is that in desert places, where these animals are rare, a solitary vizcachera is never seen; but there are always several close together, though there may be no others on the surrounding plain for leagues. When the Vizcacha has made his habitation, it is but a single burrow, with only himself for an inhabitant, perhaps for many months. Sooner or later, however, others join him: and these will be the parents of innumerable generations; for they construct no temporary lodging-place, as do the Armadillos and other species, but their posterity continues in the quiet possession of the habitations bequeathed to it; how long, it is impossible to say. Old men who have lived all their lives in one district remember that many of the vizcacheras around them existed when they were children. It is invariably a male that begins a new village, and makes his burrow in the following manner, though he does not always observe the same method. He works very straight into the earth, digging a hole 12 or 14 inches wide, but not so deep, at an angle of about 25° with the surface. But after he has progressed inwards a few feet, the Vizcacha is no longer satisfied with merely scattering away the loose earth he fetches up, but cleans it away so far in a straight line from the entrance, and scratches so much on this line (apparently to make the slope gentler), that he soon forms a

trench a foot or more in depth, and often three or four feet in length. Its use is, as I have inferred, to facilitate the conveying of the loose earth as far as possible from the entrance of the burrow. But after a while the animal is unwilling that it should accumulate even at the end of this long passage; he therefore proceeds to form two additional trenches, that form an acute, sometimes a right angle, converging into the first, so that when the whole is completed it takes the form of a capital Y.

These trenches are continually deepened and lengthened as the burrow progresses, the angular segment of earth between them scratched away, until by degrees it has been entirely conveyed off, and in its place is the one deep great unsymmetrical mouth I have already described. There are soils that will not admit of the animals working in this manner. Where there are large cakes of "tosca" near the surface, as in many localities on the southern pampas, the Vizcacha makes his burrow as best he can, and without the regular trenches. In earths that crumble much, sand or gravel, he also works under great disadvantages.

The burrows are made best in the black and red moulds of the pampas; but even in such soils the entrances of many burrows are made differently. In some the central trench is wanting, or is so short that there appear but two passages converging directly into the burrow; or these two trenches may be so curved inwards as to form the segment of a circle. Many other forms may also be noticed, but usually they appear to be only modifications of the most common Y-shaped system.

As I have remarked that its manner of burrowing has peculiarly adapted the Vizcacha to the pampas, it may be asked what particular advantage a species that makes a wide-mouthed burrow possesses over those that excavate in the usual way. On a declivity, or at the base of rocks or trees, there would be none; but on the perfectly level and shelterless pampas, the durability of the burrow, a circumstance favourable to the animal's preservation, is owing altogether to its being made in this way, and to several burrows being made together. The two outer trenches diverge so widely from the mouth that half the earth brought out is cast behind instead of before it, thus creating a mound of equal height about the entrance, by which it is secured from water during great rainfalls, while the cattle avoid treading over the great pit-like entrances. But the burrows of the Hare, Armadillo, and other species, when made on perfectly level ground, are soon trod on and broken in by cattle; in summer they are choked up with dust and rubbish; and, the loose earth having all been thrown up together in a heap on one side, there is no barrier to the water which in every great rainfall flows in and obliterates the kennel drowning or driving out the tenant.

I have been minute in describing the habitations of the Vizcacha, as I esteem the subject of prime importance in considering the zoology of this portion of America. The Vizcacha does not benefit himself alone by his perhaps unique style of burrowing; but this habit has proved advantageous to several other species, and has been

so favourable to two of our birds that they are among the most common species found here, whereas without these burrows they would have been exceedingly rare, since the natural banks in which they breed are scarcely found any where on the pampas. I refer to the Minera (*Geositta cunicularia*), which makes its breeding-holes in the bank-like sides of the Vizcacha's burrow, and to the little Swallow (*Atticora cyanoleuca*) which breeds in these excavations when forsaken by the Minera. Few old vizcacheras are seen without some of these little parasitical burrows in them.

Birds are not the only beings in this way related to the Vizcachas: the Fox and the Weasel of the pampas live almost altogether in them. Several insects also frequent these burrows that are seldom found anywhere else. Of these the most interesting are:—a large predacious nocturnal bug, shining black, with red wings; a nocturnal *Cicindela*, a beautiful insect, with dark green striated shards and pale red legs; also a genus of diminutive wingless Wasps. Of the last I have counted six species, most of them marked with strongly contrasted colours, black, red, and white. There are also other Wasps that prey on the Spiders found on the vizcachera. All these and others are so numerous on the mounds that dozens of them might there be collected any summer day; but if sought for in other situations they are exceedingly rare. If the dry mound of soft earth which the Vizcacha elevates amidst a waste of humid, close-growing grass is not absolutely necessary to the existence of all these species, it supplies them with at least one favourable condition, and without doubt thereby greatly increases their numbers: they, also, whether predacious or preyed on, have so many relations with other outside species, and these again with still others, that it would be no mere fancy to say that probably hundreds of species are either directly or indirectly affected in their struggle for existence by the vizcacheras so abundantly sprinkled over the pampas.

In winter the Vizcachas seldom leave their burrows till dark, but in summer come out before sunset; and the vizcachera is then a truly interesting spectacle. Usually one of the old males first appears, and sits on some prominent place on the mound, apparently in no haste to begin his evening meal. When approached from the front he stirs not, but eyes the intruder with a bold indifferent stare. If the person passes to one side, he deigns not to turn his head.

Other Vizcachas soon begin to appear, each one quietly taking up his station at his burrow's mouth, the females, known by their greatly inferior size and lighter grey colour, sitting upright on their haunches, as if to command a better view, and indicating by divers sounds and gestures that fear and curiosity struggles in them for mastery; for they are always wilder and sprightlier in their motions than the males. With eyes fixed on the intruder, at intervals they dodge the head, emitting at the same time an internal note with great vehemence; and suddenly, as the danger comes nearer, they plunge simultaneously, with a startled cry, into their burrows. But in some, curiosity is the strongest emotion; for, in spite of their fellow's contagious example, and already half down the entrance, again they start

up to scrutinize the stranger, and will then often permit him to walk within five or six paces of them.

Standing on the mound there is frequently a pair of Burrowing Owls (*Pholeoptynx cuniularia*). These birds generally make their own burrows to breed in, or sometimes take possession of one of the lesser outside burrows of the village; but their favourite residence, when not engaged in tending their eggs or young, is on the vizcachera. Here a pair will sit all day; and I have often remarked a couple close together on the edge of the burrow; and when the Vizcacha came out in the evening, though but a hand's breadth from them, they did not stir, nor did he notice them, so accustomed are these creatures to each other. Usually a couple of the little burrowing *Geositta* are also present. They are lively creatures, running with great rapidity about the mound and bare space that surrounds it, suddenly stopping and jerking their tails in a slow deliberate manner, and occasionally uttering their cry, a trill, or series of quick short clear notes, resembling somewhat the shrill excessive laughter of a child. Among the grave, stationary Vizcachas of which they take no heed, perhaps half a dozen or more little Swallows (*Atticora cyanoleuca*) are seen, now clinging altogether to the bank-like entrance of a burrow, now hovering over it in a moth-like manner, as if uncertain where to alight, and anon sweeping about in circles, but never ceasing their low and sorrowful notes.

The vizcachera with all its incongruous inhabitants thus collected upon it is to a stranger one of the most novel sights the pampas afford.

The Vizcacha appears to be a rather common species over all the extensive Argentine territory; but they are so exceedingly abundant on the pampas inhabited by man, and comparatively so rare in the desert places I have been in, that I was at first much surprised at finding them so unequally distributed. I have also mentioned that the Vizcacha is a tame familiar creature. This is in the pastoral districts, where they are *never* disturbed; but in wild regions, where he is scarce, he is exceedingly wary, coming forth long after dark, and plunging into his burrow on the slightest alarm, so that it is a rare thing to get a sight of him. The reason is evident enough: in desert regions the Vizcacha has several deadly enemies in the larger rapacious Mammals. Of these the Puma or Lion (*Felis concolor*) is the most numerous, as it is also the swiftest, most subtle, and most voracious; for, as regards these traits, the Jaguar (*F. onca*) is an inferior animal. To the insatiable bloody appetite of this creature nothing comes amiss; he takes the male ostrich by surprise, and slays that wariest of wild things on his nest; he captures little birds with the dexterity of a cat, and hunts for diurnal Armadillos; he comes unawares upon the Deer and Guanaco, and, springing like lightning on them, dislocates their necks before their bodies touch the earth. Often after he has thus slain them, he leaves their bodies untouched for the *Polyborus* and Vulture to feast on, so great a delight does he take in destroying life*. The Vizcacha falls an easy victim to this

* The character of this animal (*Felis concolor*) has, I believe, been always misunderstood, and its true history is consequently yet unwritten. Of the fables

subtle creature ; and it is not to be wondered at that it becomes wild to excess and rare in regions hunted over by such an enemy, even when all other conditions are favourable to its increase. But as soon as these wild regions are settled by Man, the Lions are exterminated, and the sole remaining foe of the Vizcacha is the Fox, comparatively an insignificant one.

The Fox takes up his residence in a vizcachera, and succeeds, after some quarrelling (manifested in snarls, growls, and other subterranean warlike sounds), in ejecting the rightful owners of one of the burrows, which forthwith becomes his. Certainly the Vizcachas are not much injured by being compelled to relinquish the use of one of their kennels for a season ; for, if the locality suits him, the Fox remains with them all winter. Soon they grow accustomed to the unwelcome stranger ; he is quiet and unassuming in demeanour, and often in the evening sits on the mound in their company, until they regard him with the same indifference they do the Burrowing Owl. But in spring, when the young Vizcachas are large enough to leave their cells, then the Fox makes them his prey ; and if it is a bitch Fox, with a family of eight or nine young to provide for, she will grow so bold as to hunt her helpless quarry from hole to hole, and do battle with the old ones, and carry off the young in spite of them, so that all the young animals in the village are eventually destroyed. Often when the young Foxes are large enough to follow their mother, the whole family takes leave of the vizcachera where such cruel havoc has been made, and settle in another, there to continue their depredations. But the Fox has ever a relentless foe in Man, and meets with no end of bitter persecutions ; it is consequently much more abundant in desert or thinly settled districts than in such as are populous, so that in these the check the Vizcachas receive from the Foxes is not appreciable.

The abundance of cattle on the pampas has made it unnecessary to use the Vizcacha as an article of food. His skin is of no value ; therefore Man, the destroyer of his enemies, has hitherto been the greatest benefactor of his species. Thus they have been permitted to multiply and spread themselves to an amazing extent, so that the half-domestic cattle on the pampas are not nearly so familiar with Man or so fearless of his presence as are the Vizcachas. It is not that they do him no injury, but because they do it indirectly, that they have so long enjoyed immunity from persecution. It is amusing to see the grain-farmer, the greatest sufferer from the Vizcachas, regarding them with such indifference as to permit them to swarm on his "run," and burrow within a stone's throw of his dwelling with impunity, and yet going a distance from home to persecute with unreasonable animosity a Fox, Skunk, or other fierce creature. From the latter the loss he sustains in a twelvemonth's time is perhaps a dozen chickens and twice

that popular works on natural history go on eternally repeating, there is one that deserves a distinguished place for its absurdity ; and that is, that the South-American Lion is the most cowardly of all animals, so that a woman or a child may put it to flight.

as many eggs; whilst, but for the Vizcachas, that ruin the grass and occupy so much ground with their burrows, he could increase his year's income by one or two hundreds of pounds sterling. That the Vizcacha has comparatively no adverse conditions to war with wherever man is settled is evident when we consider their very slow rate of increase and yet see them in such incalculable numbers. The female has but one litter in the year. She becomes pregnant late in April, and brings forth in September; the period of gestation is, I think, rather less than five months. She has but two young; this, however, is not invariably the case, as I have opened one female containing three, and therefore think it probable that they may sometimes have as many as four.

The Vizcacha is about two years growing. A full-sized male measures to the root of the tail 22 inches, and weighs from 14 to 15 pounds; the female is 19 inches in length, and her greatest weight 9 pounds. Probably it is a long-lived, and certainly it is a very hardy animal. Where it has any green substance to eat, it never drinks water; but after a long summer drought, when for months they have subsisted on bits of dried thistle-stalks and old withered grass, if a shower falls they will come forth from their burrows even at noonday and drink eagerly from the pools. It has been erroneously stated that they subsist on roots. Their food is grass and seeds; but they may also sometimes eat roots, as the ground is occasionally seen scratched up about the burrows. In March, when the stalks of the perennial cardoon or Castile thistle (*Echinops ritro*) are dry, the Vizcachas fell them by gnawing about their roots, and afterwards tear to pieces the great dry flower-heads to get the seeds imbedded deeply in them, of which they seem very fond. Large patches of thistle are often found served thus, the ground about them literally white with the silvery bristles they have scattered. This cutting down tall plants to get the seeds at the top, seems very like an act of pure intelligence; but the fact is, the Vizcachas cut down every tall plant they can. I have seen whole acres of maize destroyed by them, yet the plants cut down were left untouched. If posts be put into the ground within range of their nightly rambles, they will gnaw till they have felled them, unless of a wood hard enough to resist their chisel-like incisors.

The strongest instinct of this animal is to clear the ground thoroughly about its burrows; and it is this destructive habit that makes it necessary for cultivators of the soil to destroy all the Vizcachas in or near their fields. On the uninhabited pampas, where the long grasses grow, I have often admired the vizcachera; for it is there the centre of a clean space, often of half an acre in extent, on which there is an even close-shaven turf: this clearing is surrounded by the usual rough growth of herbs and giant grasses. In such situations this habit of clearing the ground is eminently advantageous to them, as it affords them a comparatively safe spot to feed and disport themselves on, and over which they can fly to their burrows without meeting any obstruction, on the slightest alarm.

Of course the instinct continues to operate where it is no longer

of any advantage. In summer, when the thistles are green, even when growing near the burrows, and the giant thistle (*Carduus mariana*) springs up most luxuriantly right on the mound, the Vizcachas will not touch them, either disliking the strong astringent sap or repelled by the thorns with which they are armed. As soon as they dry, and the thorns become brittle, they are levelled; and afterwards, when the animal begins to drag them about and cut them up, as his custom is, he accidentally discovers and feasts on the seed. For Vizcachas are fond of exercising their teeth on hard substances, such as sticks and bones, just as cats are of "sharpening their claws" on trees.

Another remarkable habit of the Vizcacha, that of dragging to and heaping about the mouth of his burrow every stalk he cuts down, and every portable object that by dint of great strength he can carry, has been mentioned by Azara, Darwin, and others. On the level plains it is a useful habit; for as the Vizcachas are continually deepening and widening their burrows, the earth thrown out soon covers up these materials, and so assists in raising the mound. On the Buenos-Ayreal pampas numbers of vizcacheras would annually be destroyed by water in the great sudden rainfalls were the mounds less high. But this is only an advantage when the animals inhabit a perfectly level country subject to flooding rains; for where the surface is unequal they invariably prefer high to low ground to burrow on, and are thus secured from destruction by water; yet the instinct is as strong in such situations as on the level plains. The most that can be said of a habit apparently so obscure in its origin and uses is, that it appears to be part of that instinct (to which so little attention has been paid) of clearing the ground about the village. Every tall stalk the Vizcacha cuts down, every portable object he finds, must be removed to make the surface clean and smooth; but while encumbered with it he does not proceed further from his burrows, but invariably retires towards them, and so deposits it upon the mound. So well known is this habit, that whatever article is lost by night—whip, pistol, or knife—the loser next morning visits the vizcacheras in the vicinity, quite sure of finding it there. People also visit the vizcacheras to pick up sticks for fire-wood.

The Vizcachas are cleanly in their habits; and the fur, though it has a strong earthy smell, is kept exceedingly neat*. They have

* Have none of the great anatomists ever made a special study of the Vizcacha? The hind leg and foot afford a very beautiful instance of adaptation. Propped by the hard curved tail, they sit up erect and as firmly on the long horny disks on the undersides of the hind legs as a man stands on his feet. Most to be admired, on the middle toe the skin thickens into a round cushion, in which the curved teeth-like bristles are set; nicely graduated in length, so that "each particular hair" may come into contact with the skin when the animal scratches or combs itself. As to the uses of this appendage there can be no difference of opinion, as there is about the serrated claw in birds. It is quite obvious that the animal cannot scratch himself with his hind paw (as all mammals do) without making use of this natural comb. Then the entire foot is modified, so that this comb shall be well protected and yet not be hindered from performing its office: thus the inner toe is pressed close to the middle one, and

a remarkable way of dusting themselves : the animal suddenly throws himself on his back, and, bringing over his hind legs towards his head, depresses them till his feet touch the ground. In this strange posture he scratches up the earth with great rapidity, raising a little cloud of dust, then rights himself with a jerk, and, after an interval, repeats the dusting. Usually they scratch a hole in the ground to deposit their excrements in. Whilst opening one of the outside burrows that had no communication with the others, I once discovered a vast deposit of their dung (so great that it must have been accumulating for years) at the extremity. To ascertain whether this be a constant or only a casual habit, it would be necessary to open up entirely a vast number of vizcacheras. When a Vizcacha dies in his burrow, the carcass is, after some days, dragged out and left upon the mound.

The language of the Vizcacha is wonderful for its variety. When the male is feeding he frequently pauses to utter a succession of loud, percussive, and somewhat jarring cries ; these he utters in a leisurely manner, and immediately after goes on feeding. Often he utters this cry in a low grunting tone. One of his commonest expressions sounds like the violent hawking of a man clearing his throat. At other times he bursts into piercing tones that may be heard a mile off, beginning like the excited and quick-repeated squeals of a young pig, and growing longer, more attenuated, and quavering towards the end. After retiring alarmed into the burrows, he repeats at intervals a deep internal moan. All these, and many other indescribable guttural, sighing, shrill, and deep tones, are varied a thousand ways in strength and intonation according to the age, sex, or emotions of the individual ; and I doubt if there is in the world any other four-footed thing so loquacious or with a dialect so extensive. I take great pleasure in going to some spot where they are abundant, and sitting quietly to listen to them ; for they are holding a perpetual discussion all night long, which the presence of a human being will not interrupt.

At night, when the Vizcachas are all out feeding, in places where they are very abundant (and in some districts they literally swarm) any very loud and sudden sound, as the report of a gun or a clap of unexpected thunder, will produce a most extraordinary effect. No sooner has the report broken on the stillness of night than a perfect storm of cries bursts forth over the surrounding country. After eight or nine seconds there is in the sounds a momentary lull or pause ; and then it breaks forth again, apparently louder than before. There is so much difference in the tones of different animals that the cries of individuals

so depressed that it comes under the cushion of skin and cannot possibly get before the bristles, or interfere with their coming against the skin in scratching, as would certainly be the case if this toe were free as the outer one.

Again, the Vizcachas appear to form the deep trenches before the burrows by scratching the earth violently backwards with the hind claws. Now these straight, sharp, dagger-shaped claws, and especially the middle one, are so long that the Vizcacha is able to perform all this rough work without the bristles coming into contact with the ground and so getting worn by the friction. The Tehuelcho Indians comb their hair with a brush-comb very much like that on the Vizcacha's toe, but it is sad to think that they (the Tehuelchos) make so little use of it.

close at hand may be distinguished amidst the roar of blended voices coming from a distance. It sounds as if thousands and tens of thousands of them were striving to express every emotion at the highest pitch of their voices ; so that the effect is indescribable, and fills a stranger with astonishment. Should a gun be fired off several times, their cries become less each time ; and after the third or fourth time it produces no effect. They have a peculiar, sharp, sudden, "far-darting" alarm-note when a dog is spied, that is repeated by all that hear it, and produces an instantaneous panic, sending every Vizcacha flying to his burrow.

But though they manifest such a terror of dogs when out feeding at night (for the slowest dog can overtake them), in the evening, when sitting upon their mounds, they treat them with tantalizing contempt. If the dog is a novice, the instant he spies the animal he rushes violently at it ; the Vizcacha waits the charge with imperturbable calmness till his enemy is within one or two yards, and then disappears into the burrow. After having been foiled this way many times, the dog resorts to stratagem : he crouches down as if transformed for the nonce into a *Felis*, and steals on with wonderfully slow and cautious steps, his hair bristling, tail hanging, and eyes intent on his motionless intended victim : when within 7 or 8 yards he makes a sudden rush, but invariably with the same disappointing result. The persistence with which the dogs go on hoping against hope in this unprofitable game, in which they always act the stupid part, is highly amusing, and is very interesting to the naturalist ; for it shows that the native dogs on the Pampas have developed a very remarkable instinct, and one that might be perfected by artificial selection ; but dogs with the hunting habits of the cat would, I think, be of little use to man. When it is required to train dogs to hunt the nocturnal Armadillo (*Dasypus villosus*), then this deep-rooted (and, it might be added, hereditary) passion for Vizcachas is excessively annoying, and it is often necessary to administer hundreds of blows and rebukes before a dog is induced to track an armadillo without leaving the scent every few moments to make futile grabs at his old enemies.

The following instance will show how little suspicion of man the Vizcachas have. A few years ago I went out shooting them on three consecutive evenings. I worked in a circle, constantly revisiting the same burrows, never going a greater distance from home than could be walked in four or five minutes. During the three evenings I shot sixty Vizcachas dead ; and probably as many more escaped badly wounded into their burrows ; for they are hard to kill, and however badly wounded, if sitting near the burrow when struck, are almost certain to escape into it. But on the third evening I found them no wilder, and killed about as many as on the first. After this I gave up shooting them in disgust ; it was dull sport, and to exterminate or frighten them away with a gun seemed an impossibility.

It is a very unusual thing to eat the Vizcacha, most people, and especially the gauchos, having a silly unaccountable prejudice against

their flesh. I have found it very good, and while engaged writing this paper have dined on it served up in various ways. The young animals are rather insipid, the old males tough, but the mature females are excellent—the flesh being tender, exceedingly white, fragrant to the nostrils, and with a very delicate game-flavour. It is certainly infinitely superior to that of the Hairy Armadillo and the Ostrich: yet of the flesh of these, loaded with strong-smelling and rank-tasting yellow fat as it is, people in Buenos Ayres are immoderately fond.

Within the last ten years so much new land has been brought under cultivation that farmers have been compelled to destroy incredible numbers of Vizcachas: many large “estancieros” (cattle-breeders) have followed the example set by the grain-growers, and have had them exterminated on their estates. Now all that Azara, on hearsay, tells about the Vizcachas perishing in their burrows, when these are covered up, but that they can support life thus buried for a period of ten or twelve days, and that during that time animals will come from other villages and disinter them, unless frightened off with dogs, is strictly true. Country workmen are so well acquainted with these facts that they frequently undertake to destroy all the vizcacheras on an estate for so paltry a sum as tenpence in English money for each one, and yet will make double the money at this work than they can at any other. By day they partly open up, then cover up the burrows with a great quantity of earth, and by night go round with dogs to drive away the Vizcachas from the still open burrows that come to dig out their buried friends. After all the vizcacheras on an estate have been thus served, the workmen are usually bound by previous agreement to keep guard over them for a space of eight or ten days before they receive their hire; for the animals covered up are then supposed to be all dead. Some of these men I have talked with have assured me that living Vizcachas have been found after fourteen days—a proof of their great endurance. There is nothing strange, I think, in the mere fact of the Vizcacha being unable to work his way out when thus buried alive; for, for all I know to the contrary, other species may, when their burrows are well covered up, perish in the same manner; but it certainly is remarkable that other Vizcachas should come from a distance to dig out those that are buried alive. In this good office they are exceedingly zealous; and I have frequently surprised them after sunrise, at a considerable distance from their own burrows, diligently scratching at those that had been covered up. The Vizcachas are fond of each other’s society, and live peaceably together: but their goodwill is not restricted to the members of their own little community; it extends to the whole species, so that as soon as night comes many animals leave their own and go to visit the adjacent villages. If one approaches a vizcachera at night, usually some of the Vizcachas on it scamper off to distant burrows: these are neighbours merely come to pay a friendly visit. This intercourse is so frequent that little straight paths are formed from one vizcachera to another. The extreme attachment between

members of different communities makes it appear less strange that they should assist each other: either the desire to see, as usual, their buried-up neighbours becomes intense enough to impel them to work their way to them; or cries of distress from the prisoners reach and incite them to attempt their deliverance. Many social species are thus powerfully affected by cries of distress from one of their fellows; and some will attempt a rescue in the face of great danger—the Weazel and the Peccary for example.

Mild and sociable as the Vizcachas are towards each other, each one is exceedingly jealous of any intrusion into his particular burrow, and indeed always resents such a breach of discipline with the utmost fury. Several individuals may reside in the compartments of the same burrow; but beyond themselves not even their next-door neighbour is permitted to enter; their hospitality ends where it begins, at the entrance. It is difficult to compel a Vizcacha to enter a burrow not his own; even when hotly pursued by dogs they often refuse to do so. When driven into one, the instant their enemies retire a little space they rush out of it, as if they thought the hiding-place but little less dangerous than the open plain. I have frequently seen Vizcachas, chased into the wrong burrows, summarily ejected by those inside; and sometimes they make their escape only after being well bitten for their offence.

I have now given you the most interesting facts I have collected concerning the Vizcacha: when others rewrite its history they doubtless will, according to the opportunities of observation they enjoy, be able to make some additions to it, but probably none of great consequence. I have observed this species in Patagonia and Buenos Ayres only; and as I have found that its habits are considerably modified by circumstances in the different localities where I have met with it, I am sure that other variations will occur in the more distant regions, where it is influenced by other extraneous conditions.

4. On the Size of the Red Corpuscles of the Blood of the *Salmonidæ* and some other Vertebrates. By GEORGE GULLIVER, F.R.S.

[Received September 30, 1872.]

Physiologists have now recognized the great importance in all the vertebrate classes of the comparative magnitude of the red blood-corpuscles, as noticed in my memoir on those of *Moschus*, *Tragulus*, *Orycteropus*, &c. in the 'Proceedings' of this Society, February 10, 1870, wherein also are given some facts supplementary to those in the same 'Proceedings,' February 25, 1862, and in my Lectures, reported and illustrated by engravings in the 'Medical Times and Gazette,' 1862-63, concerning the value of the characters afforded by these corpuscles in systematic zoology.

The red blood-corpuscles of the *Salmonidæ* are the largest that I
PROC. ZOOL. SOC.—1872, No. LIII.

have yet examined of the osseous fishes. Referring to my MS. notes, and to my papers in the 'Proceedings of the Zoological Society,' February 22, 1848, and February 25, 1862, both of which were published since my Tables of Measurements in the Sydenham Society's edition of Hewson's Works, these blood-corpuscles of the genera *Salmo* and *Thymallus* appear to be at least a third larger than the corresponding corpuscles of most other osseous fishes. The fact seemed so remarkable and exceptional as to require further observations; and, accordingly, I have lately again obtained blood from fresh salmon and trout, and carefully measured the red corpuscles, and compared them with my old dried specimens from the same species of fish.

The results have all proved in the affirmative. They are noted below, like all my other measurements, in vulgar fractions of an English inch, and include, for the sake of comparison, measurements made at the same time of the red blood-corpuscles of a few other osseous fishes. Only the average sizes are given; and the long diameters are denoted by L. D., and the short diameters by S. D.

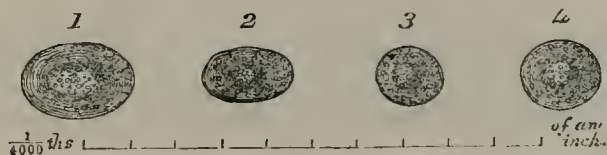
	L. D.	S. D.
<i>Salmo fontinalis</i>	$\frac{1}{1455}$	$\frac{1}{2286}$
<i>Salmo salar</i>	$\frac{1}{1524}$	$\frac{1}{2460}$
<i>Salmo fario</i>	$\frac{1}{1524}$	$\frac{1}{2900}$
<i>Salmo ferox</i>	$\frac{1}{1524}$	$\frac{1}{2900}$
<i>Thymallus vulgaris</i>	$\frac{1}{1684}$	$\frac{1}{2900}$
<i>Osmerus eperlanus</i>	$\frac{1}{2286}$	$\frac{1}{3000}$
<i>Clupea harengus</i>	$\frac{1}{2666}$	$\frac{1}{3555}$
<i>Clupea pilchardus</i>	$\frac{1}{2133}$	$\frac{1}{3200}$
<i>Cyprinus cephalus</i>	$\frac{1}{2133}$	$\frac{1}{3555}$
<i>Gadus luscus</i>	$\frac{1}{2460}$	$\frac{1}{3200}$
<i>Platessa flesus</i>	$\frac{1}{2666}$	$\frac{1}{3000}$
<i>Caranx trachurus</i>	$\frac{1}{2000}$	$\frac{1}{3555}$
<i>Trigla hirundo</i>	$\frac{1}{2666}$	$\frac{1}{3555}$
<i>Syngnathus typhle</i>	$\frac{1}{2286}$	$\frac{1}{2666}$
<i>Conger vulgaris</i>	$\frac{1}{2286}$	$\frac{1}{3000}$
<i>Anguilla vulgaris</i>	$\frac{1}{1745}$	$\frac{1}{2842}$
<i>Ammodytes lancea</i>	$\frac{1}{2000}$	$\frac{1}{3555}$

Hence it appears that, among these osseous fishes, the blood-disks of the *Salmonidæ* are the largest; and this fact will appear still wider on a comparison with an extended and revised version of my Tables of Measurements, which is now being prepared for publication. The blood-disks of the Salmons are, indeed, so nearly of the same size as

those of the Sturgeon—a cartilaginous fish—that it would be difficult to distinguish them, and are approached in magnitude by those only of the common fresh-water Eel among the osseous fishes of which I have examined the blood. It is remarkable that in this Eel the corpuscles are larger than in its bigger congener the Conger, and that in the Herring they are smaller than in its near ally the Pilchard; and how nearly the red corpuscles of the river-Eel agree in size with those of the Sturgeon may be seen by my figures in the ‘Proceedings of the Zoological Society,’ 1862, already cited. Were the red blood-corpuscle of the Salmon duly placed as regards size, it would be between the like corpuscles of *Anguilla* and *Sturio* in that engraving. The further increase in the magnitude of the red corpuscles of the Plagiostomes has been well known from Hewson’s discovery, a century since, of this fact in the Rays, to the recent extension of observations in the same order of fishes by Rudolph Wagner. In *Lepidosiren*, as I have long since shown, the blood-disks are so much larger as to present rather a batrachian than piscine character.

As regards the class of fishes, we are much in want of further observations; for the corpuscles have yet been examined in only a limited number of species and families. And the inquiry is especially difficult in osseous fishes, since their red corpuscles are much prone to very rapid changes both in size and form, and require great care in the preparation. Their size varies too, still more than in the hot-blooded vertebrates and scaly Reptiles, in the same species and in the same individual of that species. In the Appendix, p. 3, of the English version of Gerber’s ‘General and Minute Anatomy,’ 8vo, Lond., 1842, I have noticed such facts in Mammalia and Birds, and Dr. Bowerbank’s observations to the same effect in man. While in certain members of *Acanthopteri* and other ichthyic orders the blood-disks are like in their oval shape to the typical ones of Birds, there are fishes among the *Anacanthini*, *Lophobranchii*, &c. in which the majority of the blood-disks are suboval, with some of every intermediate form to a regular circle, and all this in one species or a single individual. Besides, the red corpuscles often present many (crescentic, fusiform, bent, angular, and other) figures, which may be due to changes after death, as such forms prevail in the blood of the *Gadidæ*, &c. obtained from inland fishmongers, but not in that taken with due care from living species of the same fish. Still in the live fish some of these forms may be seen, anon assuming the regular figure, in the red corpuscles circulating within the blood-vessels.

Thus far concerning the irregularities in size and shape. And as to the regular figures and average sizes of the red blood-corpuscles, they are shown by the annexed woodcut in four species, each



belonging to a different order:—1. *Salmo salar*; 2. *Caranx trachurus*; 3. *Platessa flesus*; 4. *Syngnathus typhle*. They are all drawn to a scale of which each division is equivalent to $\frac{1}{4000}$ th of an English inch, like all my other engravings of similar objects.

It was made known by Hewson that there is no relation between the size of the species and the size of its red blood-corpuscles in members of different orders of Mammalia; and my measurements show that these corpuscles are as large in the tiny Harvest-Mouse and Mole as in the big Horse and Giraffe. But about a quarter of a century ago those measurements (Appendix to Gerber's 'Anatomy, pp. 4 and 26, and Notes xcvi. and cxviii.* to Hewson's Works) proved that there is such a relation throughout the class of Birds, and in single orders or families of Mammalia; that is to say, in the class of Birds and in orders or families of Mammalia the smallest blood-disks occur in the small species, and the largest blood-disks in the large species of that class and those orders or families. In fine, throughout the class of Birds there is as much uniformity in the red blood-corpuscles as in some single orders of Mammalia, Reptiles, and Fishes; the short diameter of those constantly oval corpuscles of Birds has a general agreement with the diameter of the circular corpuscles of Mammalia; and the relation, as above explained in the highest two classes of vertebrates, has not yet been found in the lowest two classes, though the smaller size of the red blood-corpuscles in the little Smelt than in the larger species of the Salmonidæ is remarkable. And, as shown in my old Tables of Measurements, some exceptions there are to one or other of the foregoing rules, but those rules generally remain unaffected by subsequent researches. Indeed the relations of size of the red corpuscles of the blood in the different classes of vertebrates, especially as regards respiration and animal heat, are not without significance; and this will become more obvious and interesting as soon as our knowledge is extended of the gradations of size and quantity of those corpuscles in relation to the organization and economy of the species, concerning which some important points have been discussed in the first volume of the "Leçons sur la Physiologie et l'Anatomie Comparée," by Milne-Edwards.

For an opportunity of examining the blood of living specimens of *Salmo fontinalis* and *Salmo ferox* I have had the advantage, through the courtesy of Mr. Frank Buckland, of the thriving fish in his interesting museum of economic pisciculture at South Kensington.

5. Note on the Black Snake of Robben Island, South Africa†.

By Dr. ALBERT GÜNTHER, F.R.S., F.Z.S.

[Received October 7, 1872.]

The majority of herpetological collections possess, among the

† [This Snake was presented to the Society the 24th of September last, by Mr. G. H. Bramwell Fisk. Robben Island lies in Table Bay, about 7 miles off Cape Town.—P. L. S.]

numerous variations of colour of *Coronella cana*, specimens of a uniform deep-black colour. These specimens are of large size, from 3 to 5 feet in length. On the occasion of naming such an example, recently received by the Zoological Society from Robben Island, about 5 feet long, and now living in the Gardens, I reexamined two similar specimens in the British Museum, and was surprised to find that they agreed with one another, and differed from the other brown or blackish varieties, in having the scales in thirty-one rows, the latter possessing only twenty-seven or twenty-nine series of scales. It would appear that Levaillant also observed the same variety in Robben Island (Schleg. Phys. Serp. ii. p. 157*). The locality where the examples in the British Museum were obtained is not known; they, together with a young one, were presented many years ago by the Royal College of Surgeons. The young is spotted as in other varieties, but has also thirty-one series of scales.

It seems to me that this variation deserves to be distinguished by a specific name, because two characters (insignificant by themselves) coincide in a form which appears to be localized in Robben Island. I propose to designate it by the name of *Coronella phocorum*.

6. A List of the Species of *Cassididæ* found on the Coast of New South Wales, together with Remarks on their Habitats and Distribution. By J. BRAZIER, C.M.Z.S., M.R.S.N.S.W.

[Received July 15, 1872.]

1. SEMICASSIS SABURON.

Cassis saburon, Adanson, Voy. en Sénégal, pl. vii. fig. 8; Lam. Anim. sans Vert. tome vii. p. 227; Reeve, Conch. Icon. pl. v. fig. 11 a, b.

Cassis pila, Reeve, Conch. Icon. pl. ix. fig. 21.

Cassidea saburon, Bruguière.

Buccinum saburon, Dillwyn.

Hab. Near the mouths of the Macleay, Nambuccra, Bellengen and Redbank rivers, north of Port Jackson. Found also at New Caledonia by Monsieur Perroquin; on the coast of Spain, at Gijon, by Mr. McAndrew; Cadiz, by Monsieur Paz; and at Minorca by Monsieur Cardona. The shell described by Reeve under the name of *C. pila* appears to me to be only a variety of *C. saburon*.

2. SEMICASSIS (PHALIUM) AREOLA.

Buccinum areola, Linnæus.

Cassis areola, Lam. Anim. sans Vert. tome vii. p. 222.

Cassidea areola, Bruguière.

Cassis areola, Reeve, Conch. Icon. pl. ix. fig. 24.

Hab. Broken Bay, Port Stephens, Port Macquarie; and near the

* I am unable to find the reference given by Schlegel in Levaillant's second voyage.

mouths of the Macleay, Nambuccra, Bellengen, Redbank, and Clarence rivers. This species is also found at New Caledonia and the Philippine Islands.

3. SEMICASSIS (PHALIUM) CORONULATA.

Cassis coronulata, Sowerby, Tankerville Catalogue, App. p. 20; Reeve, Conch. Icon. pl. xii. fig. 31.

Hab. Broken Bay; and near the mouths of the Macleay, Bellengen, and Redbank rivers.

This species is very often mistaken for *C. glauca*, Linn., which is a very common shell, but not found on the Australian coast.

4. SEMICASSIS (CASMARIA) PAUCIRUGIS.

Cassis paucirugis, Menke, Moll. Novæ Hollandiæ, p. 23, sp. 107; Reeve, Conch. Icon. pl. viii. fig. 19 *a, b*.

Hab. Merimbula, south of Port Jackson; Encounter and Guichen Bays, South Australia; Swan River, Western Australia; it also ranges to Tasmania.

5. SEMICASSIS (CASMARIA) ACHATINA.

Cassis achatina, Lam. Anim. sans Vert. tome vii. p. 226; Reeve, Conch. Icon. pl. x. fig. 28 *a, b*.

Hab. Merimbula, Wollongong, and Botany Bay, south of Port Jackson; thrown on shore after gales. "Bottle and Glass" rocks, Port Jackson; found under stones. Also north of Port Jackson at Broken Bay; Port Stephens; Port Macquarie; near the mouths of the Macleay, Nambuccra, Bellengen, Redbank, and Clarence rivers.

6. SEMICASSIS (CASMARIA) PYRUM.

Cassis pyrum, Lam. Anim. sans Vert. tome vii. p. 226; Reeve, Conch. Icon. pl. xi. fig. 29 *a, b, c*.

Cassis zeylanica, Lam.

Hab. Botany Bay, Merimbula, Hunter's Bay and Middle Harbour, Port Jackson; Broken Bay, Port Stephens, Port Macquarie; near the mouths of the Macleay, Nambuccra, Bellengen, Redbank, and Clarence rivers. It is also found in Tasmania, and on the west coast of New Zealand.

7. SEMICASSIS (CASMARIA) TORQUATA.

Cassis torquata, Reeve, Conch. Icon. pl. i. fig. 1 *a, b*.

Hab. Near the mouth of the Macleay river, New South Wales. I obtained one fine example of this species when investigating that part of the coast two years ago.

8. SEMICASSIS (CASMARIA) SOPHIÆ.

Cassis sophiæ, Brazier, Proc. Zool. Soc. 1872, p. 617.

Hab. Near Grassy Head (*coll. Brazier*).

This beautiful shell is, so far as I know, unique in my cabinet.

7. List of Species of *Mitridæ* collected at Rarotonga, Cook's Islands, with Notes, also Descriptions of new Species.
By ANDREW GARRETT, of Tahiti.

[Received August 12, 1872.]

1. MITRA EPISCOPALIS, D'Argen.

This species occurs abundantly at all the Polynesian islands, and is invariably found on sand or sandy mud in shallow water.

2. MITRA PONTIFICALIS, Lam.

This has as wide a range as the preceding, but is much more rare, and occurs under clumps of coral on reefs.

The animal is uniform creamy-white, with opaque white dots.

3. MITRA ADUSTA, Mart.

This species, like the two above, is found at all the Polynesian groups, but is comparatively rare, except at the Viti Isles, where we obtained it in abundance from under stones in shallow water.

4. MITRA FERRUGINEA, Lam.

Also occurs at all the South-Sea islands, and lives under stones on reefs. We only found it plentiful at Tahiti and the Paumotu Islands.

The animal is cinereous, or pale yellow, slightly varied with reddish brown.

5. MITRA CARDINALIS, Gron.

Has a very wide range, and delights in sandy mud, especially on a stony bottom. It is not by any means abundant. Our finest examples were obtained in shallow water at Tahiti.

The animal is uniform creamy-white.

6. MITRA FULVA, Swains.

This species is not uncommon, and has a very wide range. It is found under clumps of coral on reefs.

The animal is chestnut-brown, with a paler siphon, and white creeping-disk.

7. MITRA CASTA, Lam.

A very rare Polynesian *Mitra*, found in sandy mud at low-water mark. We only met with it at Rarotonga and Tahiti.

8. MITRA NIVEA, Swains.

This fine species is very rare. We obtained a single mutilated example at Rarotonga, and four more or less perfect ones at Anaa, one of the Paumotu Islands.

9. MITRA PELLIS-SERPENTIS, Rve.

Is also rarely found, and seems to be confined to the Paumotu, Tahiti, and Cook's groups.

10. MITRA ABBATIS, Chem.

Only a few dead examples of this rare *Mitra* were found at Tahiti and at Rarotonga.

11. MITRA TESTACEA, Swains.

This is also a rare Polynesian *Mitra*, and only occurred in a dead condition at Tahiti, Rarotonga, Paumotu, and the Kingsmill Islands.

12. MITRA COLUMBELLÆFORMIS, Kien.

This fine species occurs under stones on reefs, and was found at the Paumotu, Tahiti, Cook's, and Kingsmill Islands.

13. MITRA DERMESTINA, Lam.

Is found at all the Polynesian islands, though not by any means common. It is met with under stones on reefs.

14. MITRA SPECIOSA, Rve.

This beautiful species is very rarely found. All we obtained were from Rarotonga, Paumotu, and Swain's Island, and were in a dead condition.

15. MITRA LITERATA, Lam.

A common species at all the Polynesian islands, and occurs on rocky ground in the upper region of the littoral zone.

16. MITRA ACUMINATA, Swains.

Under stones on reefs. Ranges all through the South Seas, but only abundant at the Paumotu and Kingsmill groups.

The animal is uniform pale yellow.

17. MITRA MACULOSA, Rve.

We obtained a few examples of this species at most of the South-Sea islands. They were found on reefs. Our finest specimens are from Cook's group.

The animal is deep chocolate-brown, the creeping-disk, tentacles, and siphon clear white.

18. MITRA NODOSA, Swains.

Common to all the Polynesian islands, but by no means abundant. On reefs. Our finest specimens are from Rarotonga. The coloured variety figured by Reeve was not met with by us at any of the South-Sea groups.

19. MITRA TUBEROSA, Rve.

Occurs at all the South-Sea islands, but only found abundantly at the Viti and Cook's Islands. On reefs.

20. MITRA BRUMALIS, Rve.

This has the same range as the preceding, but is more rare. On reefs.

The animal is uniform pale yellow.

21. *MITRA MULTICOSTATA*, Swains.

This pretty species only occurred at Rarotonga, where we obtained it on the reefs.

22. *MITRA CORONATA*, Chem.

A rare species, of which a single dead example was picked up on the beach. We also obtained it at the Sandwich, Kingsmill, Viti- and Samoa Islands.

23. *MITRA MICANS*, Rve.

Only a single, but perfect specimen was found on the reefs. We never noticed it at any other locality.

24. *MITRA CROCATA*, Lam.

Besides Rarotonga, we can mention the Samoa and Viti Islands as localities for this rare *Mitra*. Found in a dead condition on reefs.

25. *MITRA AMABILIS*, Rve.

Somewhat rare, and ranges from the Paumotu to the Viti Islands. On reefs.

26. *MITRA CUCUMERINA*, Lam.

A common species at most of the South-Sea islands, and found on reefs.

The animal is diluted white, dotted with creamy yellow.

27. *MITRA CONSANGUINEA*, Rve.

A rare species, of which several dead examples were gathered on the reefs. It is equally rare at the Samoa and Viti Islands.

28. *MITRA AURORA*, Dohrn.

If we have rightly determined this fine *Mitra*, we can add to the localities Rarotonga and the Paumotu Islands. Dohrn's examples were obtained at the Sandwich Islands.

29. *MITRA ASSIMILIS*, n. sp.

Shell oblong, subfusiform, turreted, solid, shining, whitish, with closely set transverse deep-brown slightly raised lines; spire moderately elevated, acute; whorls 8-9, plano-convex, shouldered above, longitudinally ribbed, ribs closely set, angular, slightly nodulous, 16 to 18 in number; body-whorl convexly rounded, contracted and granulated at the base; aperture narrow, bluish white and lyrate within; outer lip rather sharp and crenulate; columella with four folds.

Length 16 mill., diam. 8 mill.

Hab. Rarotonga, Samoa, and Viti Islands (*coll. Garrett*).

A very rare species, found under stones on reefs. It belongs to the same group as *M. concinna*, *crocata*, and *flavescens*.

30. MITRA FRATERCULA, n. sp.

Shell oblong, subfusiform, solid, shining, contracted at the base; spire moderately elevated, acute, brownish-yellow, transversely lined with deep brown, and adorned with a spiral white band; whorls 8-9, plano-convex, slightly shouldered, longitudinally ribbed, ribs small, closely set, angular, 16 to 18 in number, slightly nodulose above, and the interstices remotely transversely impressedly striated; body-whorl large, roundly convex, granulated towards the base; aperture narrow, little less than half the length of the shell, bluish white and lyrate within; columella with four folds.

Length 19 mill., diam. 8 mill.

Hab. Tahiti, Rarotonga, Samoa, and Viti Islands (*coll. Garrett*).

The animal is light brown, dotted and mottled with yellowish white.

A very rare species, found under stones on reefs, and belongs to the same group as the preceding.

31. MITRA LUTEO-FUSCA, n. sp.

Shell oblong-ovate, subfusiform, solid, smooth, polished, shining, yellowish brown, with large whitish spots; spire moderate, acute, half the length of the shell; whorls 9, convex, the upper ones cancellated with fine longitudinal ribs and transverse impressed lines; body-whorl slightly ventricose, rapidly tapering, and obliquely striated at the base; aperture oblong, bluish white and lyrate within; outer lip thickened above; columella with five strong folds.

Length 16 mill., diam. $6\frac{1}{2}$ mill.

Hab. Rarotonga, Cook's Islands (*coll. Garrett*).

A very rare species, of which we obtained two examples from the reefs.

32. MITRA EXQUISITA, n. sp.

Shell small, oblong, subfusiform, glassy, hyaline, pinkish red, with two transverse brown lines enclosing a white band, the band and one line continued up the spire; spire rather short, turreted, subacute, little more than half the length of the shell; whorls 9 (3 of which are embryonal), plano-convex, shouldered above, the last rounded, much contracted and granulated at the base, which is produced in a short slightly twisted canal; longitudinally ribbed, ribs closely set, rather large, angular, slightly nodulose above, 12 to 13 in number, interstices transversely impressedly striated; aperture narrow; outer lip rather thin, notched above, and slightly sinuous; columella with four folds.

Length 5 mill., diam. $3\frac{1}{2}$ mill.

Hab. Paumotu, Tahiti, Cook's, Samoa, and Viti Islands (*coll. Garrett*). It belongs to the same group as *M. recurva* and *mirifica*. Notwithstanding its wide range, it is a rare species. Under stones on reefs.

32. MITRA ZEBRINA, n. s.

Shell oblong-ovate, subfusiform, solid, ventricose, attenuated at

the base, smooth, shining, bluish white, with longitudinal flexuous brown stripes; spire rather short, concavely conical, subacute, half the length of the shell; whorls 8-9, slightly convex, finely crenulate and shouldered above, the upper ones decussated with fine longitudinal ribs and transverse impressed striæ, the latter continued on the lower whorls, and becoming obsolete on the middle of the body; aperture narrow, bluish white and lyrate within; outer lip rather thin, sinuous; columella with five folds.

Length 16 mill., diam. 8 mill.

Hab. Paumotu, Tahiti, Cook's, Samoa, and Viti Islands (*coll. Garrett*).

A very rare species, found under stones on reefs.

33. *CYLINDRA NUCEA*, Gron.

A comparatively rare species, found in sandy mud between tide-marks, and occurs at all the Polynesian islands.

The animal is diluted white, the foot and siphon margined and mottled with black and white.

34. *DIBAPHUS EDENTULUS*, Swains.

A rare species, found under stones on reefs, and ranges from the Paumotu to the Viti Islands.

Owing to the animal of this shell being unknown, it has been provisionally placed in the family *Conidæ*. While exploring the Samoa and Viti Islands, we were fortunate in discovering several living examples, and, after a careful study of the animal, could not detect any difference between it and a *Cylindra*. Unfortunately the notes and drawings made at the time were subsequently lost in a shipwreck. On plunging a living example in alcohol, the spirit became much discoloured, of a fine purple, the same as when any other *Mitridæ* are placed in spirits. Its proper place in a natural classification will be between *Cylindra* and *Imbricaria*.

35. *IMBRICARIA CONICA*, Schum.

A very abundant species, gregarious on shallow sand flats, and ranging from the Paumotu to the Viti Islands. We did not find a single example north of the equator.

36. *IMBRICARIA PUNCTATA*, Swains.

A somewhat rare species, having the same range as the preceding, and found in the same station.

The animal is diluted white, with pale brown tentacles. The foot is large, oblong, thin, rounded behind, and truncate in front. The head and tentacles are small, the latter bearing the eyes on basal enlargements.

37. *IMBRICARIA VIRGO*, Swains.

We obtained examples of this species at most of the Polynesian islands. It is not abundant, and, like all the species, delights in sand or sandy mud flats.

8. Further Observations on the Swallows of Buenos Ayres.
By W. H. HUDSON, C.M.Z.S.

[Received August 6th, 1872.]

I have already spoken in former communications * of all but one of the species of *Hirundinidæ* that visit us in this region ; the bird I have yet to describe is the *Atticora cyanoleuca*—the *Golondrinas timoneles negros* of Azara, and the smallest of our Swallows. I cannot say what are the limits of its range, as my wanderings have not extended far in any direction, and I have never yet been in any region where it is not well known. In Buenos Ayres these Swallows appear early in September, coming before the three species of *Progne* that visit us, but preceded by the *Hirundo leucorrhoa*. They are bank-birds, breeding in forsaken holes and burrows (for they never bore into the earth themselves), and are consequently not much seen about the habitations of man. They sometimes find their breeding-holes in the banks of streams, or in peopled districts in the sides of ditches, and down in wells. But if in such sites alone fit receptacles for their eggs were found, the species, instead of one of the commonest, would be rare indeed ; for on the level pampas most of the watercourses have marshy borders, or at the most but low and gently sloping banks. But the burrowing habits of two other animals, the Vizcacha (*Lagostomus trichodactylus*) and the Minera (*Geositta cunicularia*) have every where afforded the Swallows abundance of breeding-places on the plains, even where there are no streams or any other irregularities in the smooth surface of earth.

The *Geositta* bores its hole in the sides of the Vizcacha's burrows ; and in this burrow within a burrow the swallow lays its eggs and rears its young, and is the guest of the Vizcacha and as much dependent on him as the Wren or the Swallow we call domestic is on man ; so that in spring when this species returns it is in the villages of the Vizcacha we see them. There they live and spend the day, sporting about the burrows, just as the domestic Swallow does about our houses. The nest, constructed of dry grass lined with feathers, is placed at the extreme end of the burrow, and contains five or six white, pointed eggs. After the young have flown, they sit close together on a weed, thistle-top, or low tree ; and the parents continue to feed them many days.

As in size and brightness of plumage, so in language also is this Swallow inferior to his congeners, his only song consisting of a single weak, trilling note, much prolonged, which the bird repeats with great frequency when on the wing. But sometimes he utters two notes ; and then the second note, though much the same, is longer and more inflected than the first ; yet his voice has ever a mournful monotonous sound. If a rapacious bird or a Fox chances to intrude upon the burrows when they are breeding, these Swallows summon each other with cries indicative of fear and anxiety ; but even then

* See P. Z. S. 1871, p. 326, and 1872, p. 605.

these cries are neither loud nor shrill. When flying, these Swallows glide along very close to the earth, and when weary settle down (contrary to the custom of other Swallows) and rest on the level grassy plains. Like other birds of this family they possess the habit of gliding to and fro before a rider's horse to snatch up the little twilight moths startled from the grass. Seldom does a person ride on the pampas in summer without having a number of Swallows gather round him; often I have thought that more than a hundred were before my horse at one time; but, from the rapidity of their motions, it is impossible to count them. I have also noticed individuals of the four most common species of Swallow following me together; but after sunset, and when the other species have long forsaken the grass plains for the shelter of trees and houses, this diminutive Swallow continues to keep the traveller company. At such a time, as they glide about in the dusk of evening conversing together in low tremulous tones, they have a peculiarly sorrowful appearance, seeming like homeless little wanderers over the great level plains.

When the season of migration approaches, they begin to congregate in parties not very large (though sometimes as many as one or two hundred individuals are seen together); these companies spend much of their time perched close together on weeds, low trees, fences, or other slightly elevated situations, and pay very little attention to a person approaching, but seem preoccupied or preyed upon by some anxiety that has no visible cause.

This time immediately preceding the departure of the Swallows is indeed a season of deep interest to the observer of nature. The birds seem to forget their songs and aerial recreations; the attachment of the sexes, the remembrance of the spring is obliterated; they already begin to feel the premonitions of that marvellous instinct that urges them hence: not yet an irresistible impulse, it is a vague sense of disquiet; but its influence is manifest in their language and gestures, their wild manner of flight, and listless intervals. The little *Atticora cyanoleuca* disappears immediately after the other, larger species. Many stragglers continue to be seen after the departure of the main body; but before the middle of March not one remains, the migration of this species being very regular.

I give a few more remarks on other species of Swallows, and I shall have done with this family. I continue to meet so frequently with single birds and small parties of the *Hirundo leucorrhoa*, even on the coldest days of winter, that I am quite positive the birds of this species breeding as far north as Buenos Ayres city migrate in an exceedingly irregular manner, many remaining with us all the year, and that the further south we go we find their migrations become more strict and definite; for in Patagonia from March to August I saw not one of them. The same may be said of some other migratory species in this region.

This fall I noticed, as usual, large numbers of the Swallow of which I spoke in my former remarks as closely resembling the *H. leucorrhoa*, but with chestnut tinges*. When they began to pass they flew

* See P. Z. S. 1871, p. 328.

in their usual loose uncertain fashion, straggling here and there to hawk for insects as they journeyed. But late in April, after almost all the other passage birds had ceased from passing, these continued to appear; the weather was already cold; and all these late comers flew with great celerity and as directly north as if their flight had been guided by the magnetic needle.

I know yet nothing of this bird except from seeing them pass in autumn; and it seems strange to me that they should pass over Buenos Ayres flying north, unless they come straight from the Falklands, and so cross in their passage over six hundred miles of ocean.

In February I watched the Swallows passing with much interest in hopes of seeing flights of the Patagonian *Progne purpurea*, but was disappointed; probably they pass considerably to the west of Buenos Ayres. But late in summer I had observed an individual of this species associating with the Common Swallow, *P. chalybea*, which it so much resembles; and as I have seen these birds here before, I think it likely that a few pairs remain to breed as far north as this district.

9. Notes on *Propithecus*, *Indris*, and other Lemurs (*Lemurina*) in the British Museum. By Dr. J. E. GRAY, F.R.S. &c.

[Received October 11, 1872.]

(Plates LXIX.-LXXI.)

PROPITHECUS.

For many years a single species only of *Propithecus* was known, the *Propithecus diadema* of Bennett. Lately several specimens have been received from Madagascar which differ in colour from the species described by Mr. Bennett; and each set of specimens possessing a different colour has been described as a distinct species, to which often more than one name has been applied.

In the 'Catalogue of Monkeys and Lemurs in the British Museum' (pp. 90 and 136), I noticed the three species which the Museum then possessed, observing "they are so much alike that I should not be astonished if all the three named species were varieties of colour of the same animal. We have skulls of *Propithecus diadema* and *P. damonis* in the British Museum, and they are very much alike." Since that time the British Museum has received another variety of colour which I indicated as *P. bicolor* in the Annals and Magazine of Natural History for 1872, vol. x. p. 206, but which we are now informed* had been previously named *P. edwardsii* by M. A. Grandidier (Compt. Rend. 1871, lxxii. p. 231); and I should be particularly sorry to deprive my friend Prof. Edwards of the honour thus conferred upon him. I have also had the opportunity of examining several specimens of the three other presumed species, and also of comparing the skulls of *P. bicolor* and *P. edwardsii* with the other

* See Ann. & Mag. N. H. 1872, vol. x. p. 298.



C. Berg. au. del et lith.

Munster Bros imp.

PROSIMIA RUFIPES. 1 ♂ 2 ♀.





C. Bergeau del et lith

Mintern Bros. imp.

CHEIROGALEUS TYPICUS 1 ♂ 2 ♀.



skulls, and I am now more convinced than I was formerly that what had been considered species are merely variations, or breeds, of the same species, which seems to be a very variable one; at least I have not been able to find any organic character by which they can be separated, either in the colour or external organization, or in the skull.

The varieties may be thus divided (and there are specimens of the first five in the British Museum) :—

1. *edwardsii*. Black or blackish, the hinder part of the upper part of the body whitish or yellowish. *P. edwardsii*, Grandidier; *P. bicolor*, Gray.
2. *diadema*. Grey; hands, top of head, shoulders and upper part of the back black or blackish; limbs yellowish; circumference of face white. *P. diadema*, Bennett.
3. *damonis*. White; chest and outer side of the fore and hind limbs rusty red. *P. damonis*, Pollen; *P. coquerellii*, M.-Edwards.
4. *verreauxii*. White; crown and nape brownish black. *P. verreauxii*, Grandidier.
5. *coronatus*. White; circumference of face black; chest reddish. *P. coronatus*.
6. *deckenii*. White, with a small black spot on the back of the neck. *P. deckenii*, Peters, Monatsb. 1870; *P. diadema*, Peters, V. d. Deck. Reis. Ost-Afric. t. i. *

Thus we see that the colour of the five gradually passes from black to nearly pure white; and I should not be surprised to receive black specimens without any white, and white specimens without any black. The naked or nakedish part of the skin, seen through the hair, in all the specimens which I have seen is black; but in several of the more or less white specimens preserved on the Continent, so much white substance is used in the preparation, that the skin appears nearly white; the white, however, comes off. I suspect that that must be the case with the specimen (*P. deckenii*) figured by Dr. Peters.

The fur on the underpart of the body and the inner side of the limbs is very sparse.

There is in the British Museum a skull of *Propithecus diadema*, and also of *P. edwardsii*, *P. coronatus*, and *P. damonis*. These skulls vary considerably in size and in the shape of the auricular bullæ. That of *P. edwardsii* is the largest; and next to it, but rather smaller, is *P. diadema*; *P. damonis* is about the same size, but more conical; *P. coronatus* is rather smaller, with a slightly angular ridge behind. In *P. edwardsii* the forehead between the eyes and rather behind is convex, and the brain-case appears somewhat more ventricose. In *P. diadema* the forehead is flat or very slightly concave. In *P. damonis* and *P. coronatus* the forehead is concave on each side, with a convexity in the middle. In *P. coronatus* the nose is much broader and more swollen than in the other three species or varieties; but the nose of this skull appears to have

* The British Museum has since received a specimen with greyish black instead of white on the forehead (Ann. & Mag. N. H. 1872, x. p. 474).

a disease of the bone. This is probably from the animal having died in confinement. There is only a single skull of each of these species or varieties in the British Museum; and the differences appear to be individual rather than specific; probably the one with the broad nose is a male and the rest are females, or the converse.

INDRIS.

The Indri (*Indris brevicaudatus*), like the *Propithecus*, appears to vary a great deal in the amount of white with which the general black colour of the animal is variegated. The British Museum has received a specimen of the animal which has been described as a species by Dr. Peters (Monatsb. 1871, p. 360) under the name *Lichenotus mitratus*, brought by Mr. Crossley from Sera Lalaw. It is peculiar for having, in addition to the white rump of the other species, a white ruff round the neck and on the back of the head; and the outer side of the fore and hind legs and the sides of the body are more distinctly white than in the common Indri. I have compared the skull with that of the common black *Indris brevicaudatus*, and can find no difference, any more than I can any organic difference in any other part of the specimens; I believe that, like the white specimen called *Simpouné* (*Indris albus*, Vinson, Compt. Rend. iv. p. 829), it is only an accidental variety. These black *Indrisina* appear to be peculiarly liable to become variegated with white, or even to become entirely white, or with a very small amount of black only*.

I propose to replace the table of the genera of Lemuridæ, which have six cutting-teeth in the lower jaw, and six grinders on each side of each jaw, given in the appendix at the end of the 'Catalogue of Monkeys and Lemurs in the British Museum' (1870, p. 131), by the following. I may state that there is a mistake in that table caused by leaving out a line.

Table of Genera.

- I. *Intermaxillaries very small, truncated in front. Cutting-teeth none, or two, one behind the other, at the base of the canines. Ears moderate, hairy.* LEPILEMURINA.
 1. LEPILEMUR. Upper cutting-teeth none. Ears moderate.
 2. HAPALEMUR. Upper cutting-teeth 2-2. Nose narrow in front.
 3. PROLEMUR. Upper cutting-teeth 2-2. Nose broad, truncated in front.
- II. *Intermaxillaries prominent and arched in front. Upper cutting-teeth in a curved series, the two middle usually longer and larger than the others and converging towards the central line.*
 - A. The ears moderate, covered externally with fur, the tail long.

* The British Museum has since received a specimen with a white patch over each eyebrow, the fore legs nearly to the hands, the hinder part of the thigh, the legs from the knee to the ankle, and the whole underside iron-grey. (*I. variegatus*, Ann. & Mag. N. H. 1872, x. p. 474.)

Brain-case oval, nose rather produced, once and a half as long as the diameter of the moderate orbits. The upper cutting-teeth on the outer part of the sides of the prominent intermaxillaries. LEMURINA.

4. LEMUR. Wrist with a narrow bald line and pad above. Tail with black rings.
5. PROSIMIA. Wrist entirely hairy. Tail not ringed. Head without a ruff.
6. VARECIA. Wrist entirely hairy. Head with a ruff. Eyebrows and skull very prominent.

B. The ears short, rounded, covered externally with close appressed hair, and naked on the edge. Tail cylindrical or conical. The cutting-teeth on the middle of the sides of the prominent intermaxillaries, with a moderate central space; the middle generally the largest. CHEIROGALEINA.

* Brain-case oval. Nose contracted in front of the orbit, scarcely narrower in front.

7. OPOLEMUR. Tail thick, tapering towards the end, and covered with rather longer hair at tip. (Fig. 1, p. 854.)

** Brain-case subglobular. Nose broad, tapering in front, a little longer than the diameter of the orbit.

8. PHANER. Inner upper cutting-teeth very large, projecting upwards and forwards. Tail with soft diverging hair.
9. CHEIROGALEUS. Inner upper cutting-teeth moderate. Tail with woolly hair. (Figs. 2 & 3, pp. 855, 856.)

*** Brain-case subglobular. Nose broad, tapering in front, shorter than the diameter of the large orbits.

10. MIRZA. Inner upper cutting-teeth moderate, converging. Tail with straight rigid hair.
11. AZEMA. Inner upper cutting-teeth nearly equal, erect. Tail with soft hair. (Fig. 4, p. 856.)
12. MURILEMUR. Inner upper cutting-teeth twice as long and large as the outer, which are very small. Tail with short soft hair.

C. The ears very large, naked, plicate. Tail hairy, often bushy. The brain-case globular, thin. Nose tapering in front. Upper cutting-teeth equal, cylindrical. GALAGONINA.

† The upper cutting-teeth strong, in an arched line, shelving and near together in front.

13. SCIUROCHEIRUS. Intermaxillaries thickened and convex above on the upper part of the upperside. (Fig. 5, p. 858.)

†† The upper cutting-teeth very slender, in a nearly straight line, close to the canines, erect, leaving a large central space.

14. HEMIGALAGO. Intermaxillary bone large and produced above on the underside of the nose-hole, convex below.

15. OTOLICNUS. Intermaxillary bone moderate, nearly erect above. (Fig. 6, p. 859.)

**** Brain-case ovate, solid. Nose not narrowed in front. Upper cutting-teeth quite close to the inner side of the canines, leaving a broad central space, erect, equal. Intermaxillary bone simple, thin.

16. EUOTICUS. Skull short and broad. Face short, two-thirds as long as the diameter of the very large orbits.
17. OTOGALE. Skull ovate. Face rather elongate, as long as the diameter of the moderate sized-orbits.

Or the last section, C, may be divided thus:—

* *The nose conically elongate beyond the upper lip; skull thin, globular; intermaxillary high and convex in front above.*

13. SCIUROCHEIRUS. Tail bushy. Upper cutting-teeth in an arched line.
14. HEMIGALAGO. Tail slender. Upper cutting-teeth very slender, nearly in a straight line, close to the canines.

** *Nose truncate, simple, not produced beyond the upper lip; intermaxillary not thickened in front; upper cutting-teeth close to the canines.*

15. OTOLICNUS. Skull globular, thin. Upper cutting-teeth small.
16. EUOTICUS. Skull ovate, solid. Face two thirds the diameter of the orbit.
17. OTOGALE. Skull ovate, solid. Face as long as the diameter of the orbit.

More detailed characters of the new genera are given in the ‘Catalogue of Monkeys and Lemurs in the British Museum,’ and therefore are not repeated here.

Tribe 1. LEPILEMURINA.

1. LEPILEMUR, Gray, Cat. Monkeys & Lemurs, 1870, p. 134.

The skull of this genus is figured in Pollen’s ‘Fauna Madagascar.’ t.7.f.3. M. Adolphe Milne-Edwards says that there are cutting-teeth in the upper jaw when the animal is young; but I do not know on what authority. They must be very small, as the intermaxillary bone is so slender.

LEPILEMUR PALLIDICAUDA.

Fur pale grey; chin, inner side of limbs and underside of body whitish. Shoulders and outer side of the fore legs brownish-washed, the tail uniform pale brownish or reddish white-grey, like the back at the upperside of the base, which extends the furthest down the tail in the female.

“*Cheirogaleus major* ♀,” Frank (from Mus. Leyden?).

? *Lepilemur ruficaudatus*, Grandidier, Rev. et Mag. Zool. 1867, p. 256. Frank (from Mus. Leyden).

Hab. Madagascar (*Berarding*, 1871).

There are two skulls of this animal in the British Museum. They